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PATHOLOGICAL REPORT

MONTREAL

GENERAL HOSPITAL

1876-77

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MONTREAL GENERAL HOSPITAL.

PATHOLOGICAL REPORT

FOR THE YEAR ENDING MAY 1ST, 1877,

BY

WILLIAM OSLER, M. D.

OF MCGILL UNIVERSITY.

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To My Teacher

JAMES BOVELL, M. D.

EMERITUS PROFESSOR OF PATHOLOGY IN THE TRINITY MEDICAL SCHOOL, TORONTO

THIS FIRST PATHOLOGICAL REPORT FROM A

CANADIAN HOSPITAL

IS GRATEFULLY AND AFFECTIONATELY INSCRIBED.

PREFACE.

Records of exactly one hundred autopsies have been entered in the post-mortem book of the General Hospital for the year ending May 1st, 1877. A few of special interest occurring in private practice have been included.

The post-mortems are performed under my supervision by the students attending the Hospital, and the system of inspection followed is that of Virchow, at the Charité, Berlin, fully given in his "Sections-Technik." The notes are taken on the spot from dictation.

In the following Report brief summaries are given of the cases of practical and scientific interest.

When possible, a synopsis of the clinical features is also given. The cases are grouped under the various organs affected, as this is thought to be a more convenient method than dealing with the individual diseases; and, as a rule, the organs are dealt with in the order of their pathological importance.

To the Medical Staff of the Hospital, by whose order the autopsies are conducted, I am deeply indebted, not only for permission to publish this report, but also for their kind courtesy in all matters relating to these investigations.

1351 St. Catherine Street,
Dec. 10th, 1877.

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PATHOLOGICAL REPORT.

MONTREAL GENERAL HOSPITAL.

Osseous System.—*Fractures.*

Case lxxi.—*Fracture of 1st and 2nd ribs near vertebræ, from direct violence; deep abscess of the neck; obliteration of subclavian artery; Empyema.*

J. L., æt. 20, was struck on the sternum by the shaft of a fire engine; almost immediately after a tumour formed in the supra-clavicular region, the arm on that side became paralysed, and on admission was pulseless. Tumour inflamed, was opened, and discharged a milky fluid and blood, subsequently pus. Empyema supervened, and death.

Abscess found to be deep in the neck, immediately above the left pleura, and about as large as a good-sized orange. On putting the fingers into the sac the ends of the fractured ribs can be felt in the posterior wall. The fracture of the 1st rib is straight, just external to the tuberosity; the inner end is imbedded in the wall of the sac, the outer lies one and a half inches from it. The 2nd rib is fractured obliquely, just external to the angle, and is also comminuted. The inner end projects into the sac as a rough, sharp process, and lies at a higher level than the outer end which is external to it. Between the two is a small separated portion enclosed in the sac wall. The lining membrane of the cavity is stained, and in places covered with flakes of fibrin. Immediately below the anterior part of the floor of the sac, the apex of the left

lung is free, crushed and is separated from the abscess by condensed tissue ½ of an inch in thickness. At the posterior part of the floor only a thin membranous partition exists from the pleural cavity. An orifice in communication with an external one at the root of the lung exists at the upper part of the anterior wall. The subclavian artery runs along the inner and upper part of the cavity, but somewhat out of its course. It is completely obliterated by a thrombus, which begins at the first rib and extends to the first portion of the axillary. The subclavian vein is also obliterated, though not to any extent. Above the artery, at the top of the cavity, the brachial plexus, the cords of which appear stretched and flattened.

Between two and three pints of pus in the left pleural cavity. Lung compressed.

Acute Necrosis.—Pyæmia.

Case XXXV. *Necrosis of tibia. Ulcerative endocarditis. Lobular pneumonia.*

J. D., æt. 12, male. No definite history of an injury. Pain of a rheumatic character about the joints, only slightly more marked at the left ankle; symptoms of pyæmia; death within a week.

Acute periosteal abscess found in the lower end of left tibia with necrosis of the bone which is denuded and roughened, especially in front. The cancellated part does not appear much affected.

Pericardium is beginning to inflame. In the anterior wall of the conus of the right ventricle is a purulent depot the size of a bean, and not far from it a superficial loss of substance half the size of a three-penny-bit. Traces of atheroma in the sinuses of Valsalva.

Scattered throughout both *lungs* are small, firm, slightly-elevated spots, ranging in size from a pea to a marble. They are most abundant in the upper lobes. On section

some are dark in colour, their firmness alone distinguishing them from the lung tissue; others have a greyish red appearance, while others again have softened in the centre, forming small abscesses. A small supernumerary *spleen* is present.

CASE XCVI. — *Necrosis of femur. Pyæmic pneumonia. Abscesses in superficial muscles. Pustular eruption on skin.*

J. C., æt. 30.—The clinical features of the case are well summarized by Mr. Vineberg,* as follows: The disease attacked a strong and apparently healthy man; no history of injury; the symptoms at the outset simulated those of rheumatism; the pyæmia set in rapidly, ran its course without rigors or marked fluctuations and remission of temperature, while the presence of a pustular eruption and erysipelatous patches on the skin, with the tuberous elevation beneath the skin—not unlike farcy buds—and the general symptoms, presented a clinical picture very like that of glanders.

Left Femur.—Muscles of anterior region of lower third of thigh infiltrated with pus, the posterior ones not so much so, and here and there are distinct abscesses. The periosteum of the lower end of the femur is raised, and contains beneath it much pus, the bone is bare and roughened in front, behind, and on the inner side; on the outer side the periosteum is still adherent. It is covered with a dirty greyish exudation. Scrapings from the bone and roughened surface examined with the microscope show an enormous number of large myeloplaques. The marrow where the bone is sawn looks healthy; that of the end of the bone itself was not examined.

Skin.—Numerous flattened pustules with reddened bases exist over the skin of trunk and upper extremities.

Muscles.—In those of the arms and legs many small

* In a paper read before the McGill Medical Society, May 8, 1877.

tuberous swellings can be felt, which, on section, are found to be abscesses in the substance of the muscles.

Long int. saphenous vein occluded by a thrombus.

Blood dark and fluid. During life there was a large number of Schultze's granular masses, and the net-work of fibrin fibrils which separated out on the slide under the microscope was unusually dense and coarse.

Commencing *Pericarditis* over right auricle.

Lungs. — Numerous firm, slightly-elevated, nodules, ranging in size from a pea to a marble, in all the lobes, but most abundant in the lower. On section, most of them present a white granular surface, interspersed here and there with hæmorrhages; some of the larger ones in the lower lobes have softened at the centre into abscesses. The margins of these pneumonic areas are congested, sometimes hæmorrhagic.

Cancer.

CASE LXXXII.—*Primary Cancer of bodies of 2nd and 3rd vertebræ and heads of corresponding ribs on right side. Secondary masses in ribs, liver, and brain. Chronic phthisis. Lobar pneumonia.*

M. C., æt. 52:

Vertebræ, 2nd and 3rd. Bodies not enlarged, but soft and porous. On stripping off the anterior ligament, a soft, greyish-white juice oozes out. The transverse and articular processes also involved. Two soft cancerous growths spring from the junction of the laminæ and body of the 2nd, and encroach upon the calibre of the canal; at the centre of the back part of the body of the 3rd, is another tuberous outgrowth. The cord does not appear much compressed by these masses, and the membranes are unaffected.

Ribs, 2nd (right side). For two inches beyond the angle the bone is enlarged, double the size of the 3rd; the articular surfaces are bare. The compact tissue has disap-

peared, and the cancerous growth has elevated and infiltrated the periosteum. On section large cancellæ are seen, filled with a reddish-white juice. At the middle of this rib is an irregular swelling, one inch in length, which presents the same appearance as the head.

3rd Rib (right). Not nearly so much enlarged, the articular surfaces not affected. Compact tissue gone, but periosteum is free.

8th Rib (left). An elongated swelling about the middle, one and a half inches in length, most marked internally. On section external part soft and cuts readily; the central part is hard and dense.

9th Rib (left). A still larger swelling of same character, two inches in length; not hard in the centre, but not so porous as the heads of the affected ribs.

Liver not enlarged; contains a dozen or more white masses, situated superficially, ranging in size from a walnut to a small pea; surfaces of most on a level with liver —the larger are elevated and with depressed centres. On section many hæmorrhagic centres are seen in them.

Brain. A rounded cancerous mass—1½" by 1¼"—occupies the superior parietal convolutions of the right side, extending into the longitudinal fissure for a short distance. On section it is greyish-yellow in colour, except at the centre and margins, where there is more blood. Small masses also in the right corpus striatum and left thalamus opticus, and on the pia mater of the lower convolution of the left occipital lobe, and on the pia mater of the right crus cerebri. All of these, on examination, are cancerous in character.

Lungs. Left is emphysematous, several very large blebs existing near the root. Throughout both lobes are numerous, firm, fibroid tubercles, ranging in size from a pin's head to a pea. Lower lobe is solidified, in a state of red hepatization, the air cells being filled up with fibrinous plugs.

The right lung contains hardly any air. At the lateral part of the upper lobe is a large dense caseous mass, the size of an orange, with a sharp, round contour towards the lung and much puckered on the pleural surface. It is very firm and on section beautifully marbled. At the lower and back part of this lobe the lung presents a very peculiar appearance over an area equal in size to an orange. It is irregular, soft, and spongy: no definite cavity exists, but the tissue at the upper part is soaked with pus, while below there is pus mixed with blood. It looks not unlike the fibrin of blood clot soaked with pus but on examination proves to be a rapidly breaking down lung tissue, infiltrated with cellular elements. The pleura over it is very thick and fibrous. Nearly the whole of the lower lobe is in a condition of grey induration, being firm airless, and scattered through it are a few caseous masses.

Circulatory System.—Heart.

In this case of heart disease, one only presented features of unusual clinical and pathological interest. It is an instance of hypertrophy with dilatation and advanced fatty degeneration, consequent, I believe, upon prolonged mental exertion. I am indebted to Dr. Ross, under whose care he was, for permission to use the clinical notes taken by Dr. James Bell at that time the ward clerk.

Case No. — *Hypertrophy and dilatation of the heart. Nutmeg appearance of liver. Nephritis, kidney affection. Hydrothorax. Pulmonary œdema. General venous stasis.*

J. W., aet. 38, was admitted November 2nd, 1887, with dyspnœa, hæmoptysis and vomiting. He is a large powerfully built man, with strongly developed muscles and in good condition. His family history is good. Was a soldier for 18½ years, serving in India and other foreign stations. Never had syphilis or rheumatic

fever. Has always been a healthy man, though intemperate. In July last he suffered from shortness of breath and slight hæmoptysis, for which, in August, he entered the hospital, and was under treatment nearly two months for "some heart affection," being discharged very much improved. He then worked for three weeks as a day labourer, and suffered much from exposure to cold and wet. On October 20, he had a chill, which was followed by swelling of the legs and abdomen, with slight dyspnœa. He gave up work on the 24th, and was treated as an out-door patient for a few days before entering Hospital on November 2nd. When admitted, in addition to the above mentioned symptoms, he complained of great pain over the region of the heart. The legs were œdematous, and the conjunctivæ and face of a sub-icteroid hue. On physical examination, the cardiac dulness is found to extend as high as the upper border of the 3rd rib, and to the right border of the sternum. A systolic murmur was heard at the left edge of the sternum in the 3rd interspace. Apex beat cannot be distinctly felt. The pulse at the wrist is barely perceptible. There is dulness over the lower lobe of the left lung. Rough snoring râles are heard over the front of the chest, and coarse bubbling râles behind. Liver dulness extends from the 5th interspace to the costal margin. The urine contains nearly 25 p. c. of albumen. The day after admission, he expectorated nearly 3 pints of florid blood, and vomited very frequently. In spite of treatment (dry cupping, ergot, digitalis, etc.), his condition became worse. On November 5th, the pulse was quite imperceptible at the wrist, the cyanosis became extreme, and the patient died early on the morning of the 6th, with all the symptoms of chronic valvular disease.

Post mortem, 30 hours after death. Face, neck and skin of thorax intensely livid. Tissues beneath the skin of anterior part of trunk and about the root of the neck

emphysematous. Scrotum much swollen. Leg œdematous. *Pericardium* contains ℥ii of serum; sub-pericardial fat tolerably abundant. *Heart* weighs 610 grms. (21⅓ oz.) Right chambers distended with dark clots and fluid blood; the venæ cavæ are also dilated and full, much blood escaping from them in the removal of the organ. Right auricle is very large, size of a small orange; walls of about the usual thickness. Right ventricle dilated, anterior wall measures ¼″ in thickness; columnæ carneæ are not hypertrophied. Tricuspid orifice 5⅞″ in circumference; valves healthy. Pulmonary valves normal; circumference of orifice 3″. Left ventricle contains some fluid blood, and a small partially decolorized clot in the mitral orifice. The chamber is much dilated, measuring 4½″ from apex to aortic ring, and bulges considerably towards the right ventricle. Endocardium thick and opaque, especially over the septum. Musculi papillares fibroid at apices. Walls, over middle of anterior part, ⅛″ in thickness; posterior wall ½″; ventricular septum, a quarter of an inch below aortic valve, ½″. Mitral valves slightly thickened at the edges, otherwise healthy. Orifice measures 4¼″ in circumference. Aortic valves competent, segments thin and natural looking; orifice, at the ring, measures 2¾″ in circumference. Aorta looks—relatively—smaller than natural. It is not atheromatous, either in the arch or in its course. Muscular substance of whole heart, and especially the left ventricle, looks pale, and on examination is found in a condition of advanced fatty degeneration; a good deal of fatty infiltration also exists between the individual fibres. *Arteries* of the body do not present any signs of degeneration.

Lungs. ℥xcvi of serum in left pleura, and the lung on this side is collapsed and only slightly crepitant above. Two very large spots of apoplexy in the anterior part of upper lobe, and about them the lung tissue is hepatized. Another, also large, occupies the anterior border of the lower lobe. Right lung is crepitant, but contains much

blood and serum. At the lower part of anterior lobe in front is a small, consolidated area.

Spleen, 250 grms., firm.

Kidneys, not enlarged. Capsules detach easily; surfaces smooth. On section pyramids and Malpighian tufts of the cortex are injected.

Stomach and intestines present nothing unusual; the large and small veins are very full.

Liver, a little enlarged, of good consistence; venules of hepatic vein gorged—nutmeg organ.

Brain. Sinuses of dura mater and veins of the pia mater full. Arteries at the base not diseased. Nothing abnormal in the substance.

When this case came under observation in the autopsy room, I confess to have been not a little puzzled, and so impressed was I at the time with the unusual character of the lesion that a most searching examination of the different organs was made, and accurate measurements of the heart taken. There were none of the common causes present to account for the hypertrophy of the heart—no valvular disease, no arterial degeneration, no chronic renal or pulmonary disease; and though aware of the fact that an idiopathic (so-called) hypertrophy of the heart was described, still, I did not know that a fatal issue might follow in such a case with all the symptoms of chronic valvular disease; nor did a consultation of the various works on the heart guarantee such a supposition. A few months after, in Nos. 17 and 18 of the *Berliner Klinische Wochenschrift*, 1877, an article appeared upon a fatal case of dilatation and fatty degeneration of the heart, consequent upon prolonged muscular exertion, which in its symptoms and anatomical characters is almost the exact counterpart of the one here recorded, except that the dilatation was a little more marked, and the hypertrophy not so great. On making enquiries it was ascertained that this patient had always been a very powerful, muscular man, and since his discharge from the army had worked

[illegible] from which [illegible] pointed [illegible] to the [illegible] of what the [illegible] past [illegible] However in the absence [illegible] recognised cases of heart disease it [illegible] with the views of Dr. Meyers, [illegible] Flint, and others before us to attribute the [illegible] to prolonged muscular [illegible]

[illegible] of the [illegible] interest that [illegible] more fully in a separate paper.

Malformations of the aortic valves.—In exactly 10 per cent. of the [illegible] these peculiar little perforations met with in [illegible] while in the pulmonary semilunar they [illegible] per cent. They are either congenital [illegible] and probably have no pathological significance.

ARTERIES.

Atheroma.—In twenty three cases the aorta presented [illegible] degeneration, usually slight in amount. In [illegible] cases the iron was blackened and the atheromatous [illegible] very marked.

Aneurism.

Case XXVII.—*Aneurism of commencement of thoracic aorta, measuring [illegible]. Death from general Tuberculosis.*

[illegible] a well-built muscular man. The aorta [illegible] with several calcareous plates and patches [illegible] A large aneurism, the size of the fist, found [illegible] the termination of the arch. It contains numerous [illegible] laminæ. The posterior wall of the sac [illegible] by the 3rd, 4th and 5th dorsal vertebræ, which [illegible] and eroded.

Left ventricle hypertrophied [illegible] the heart [illegible]. The lungs studded with [illegible] tubercles, and at

the apices small caseous masses. It is an interesting fact that, so far as could be ascertained, this patient had never suffered from any symptoms of aneurism.

CASE XLIX.—*Sacculated aneurism of ascending portion of arch of aorta. Rupture into the right pleural sac.*

J. C., æt. 40, a well-built muscular man. A little to the right of the middle of the sternum is an irregular oval swelling. On opening the thorax the cartilages of the 3rd, 4th, and 5th ribs on the right side, with the corresponding portion of the sternum, are found much eroded, the 3rd cartilage having almost entirely disappeared. The sac of the aneurism lies immediately beneath the sternum, which, with the above-named cartilages, forms its anterior wall. In the rest of its extent the wall is made up chiefly of condensed pleural and mediastinal tissues. It springs from the right side of the ascending part of the arch, with which it communicates by a rounded orifice 1½″ in diameter, the margins of which are thick and project into the sac. The contents consist of fresh coagula and old laminæ of fibrin; the entire mass when removed from the sac filled the two hands.

The site of rupture was discovered at the right side of the sac, close under the ribs, at which point the blood had burst into the right pleura through an opening ¼″ in diameter.

The right pleural cavity is full of coagulated blood, the serum floating uppermost. A large clot, forming a mould of the cavity and grooved by the ribs, was removed entire, and weighed 3½ lbs. The lung on this side is compressed and airless; the visceral layer of the pleura over it rough, and covered with minute patches of lymph. The left ventricle is hypertrophied; muscle of good colour. Aortic valves a little thickened and puckered at the edges. Patches of atheroma exist in the intima of the arch.

[illegible] — *Sacculated Aneurism of aorta, at termination of [illegible] unsuspected during life. Death from [illegible]*

V[illegible] [illegible] hours after admission.

Heart [illegible] contains a dense decolorized [illegible] hypertrophied. Aortic semi-lunar [illegible] atheromatous at bases and about corpora [illegible]

Aorta. — Vessel [illegible] dilated, the intima thickened and roughened [illegible] of the descending portion there [illegible] aneurism, the size of a billiard ball, projecting from the anterolateral part of the vessel towards the right side. The orifice of communication with the sac [illegible] in diameter. The intima terminates by [illegible] margin at the orifice. The wall of the sac is made up chiefly of the outer coat, and is lined with condensed [illegible] of fibrin.

[illegible] Aneurism of Hepatic Artery. Right branch [illegible] ruptured. Multiple abscesses in the Liver.

V[illegible] [illegible] admitted into Hospital Nov. 8, 1876, [illegible] Dr. Ross. Died Dec. 7. Symptoms those of abscess [illegible] For [illegible] report by Dr. Ross, see *C. M. and [illegible] Journal*, Dec. 1877.

[illegible] well nourished. Skin of a dirty-brown colour. [illegible] abdomen about 32 oz. of yellow turbid fluid. In [illegible] right pleural cavity about 20 oz. of similar fluid. *Right lung* collapsed. The pleura covered with a thin layer of greenish-yellow lymph. On section, the lung is dark, airless, and solidified. *Left lung.* On the visceral layer of the pleura, especially behind, are numerous small ecchymoses. On section, organ contains much blood, is [illegible] and only slightly crepitant. *Heart* normal. *Kidneys* [illegible] cortex swollen, and Malpighian tufts injected. Spleen weighs 14½ grms. [illegible] oz., adherent to the stomach.

Organ soft. On section dark and congested. *Intestines* normal. No trace of ulceration in the large bowel. *Bladder* and prostate, normal.

Liver, weight 4879½ grms. (10¾ lbs). The peritoneum around it in many places shows signs of inflammation, the left lobe being intimately adherent to the stomach by a thick layer of firm yellowish-coloured lymph; the right lobe is also cemented to parts in its neighbourhood by lymph of a similar character. A small amount is also observed on the descending colon, but the general peritoneal surface is not affected, the serous covering of the intestines being clear and glistening. The liver itself retains its normal shape, the upper surface is smooth and not adherent. Towards the right border a yellowish-coloured swelling is evident, which is perceptibly fluctuating. Other less distinct yellowish spots are seen scattered over the organ. To the touch the upper and back part of the right lobe is exceedingly soft and fluctuating. On the under surface many yellowish-white nodules are apparent, some large, others quite small, all distinctly fluctuating. A similar one of large size is apparent on the under surface of the left lobe. A transverse incision through both lobes reveals the fact that we have to deal with a diffuse suppurative hepatitis. An immense quantity of yellowish-white, custard-like pus flowed out. The right lobe is completely honey-combed by a series of small, closely united abscesses, ranging in size from a marble to a walnut. The septa between these are composed of a dark-red tissue. Most of these small abscesses communicate together; some have merged to form larger ones. They all possess distinct lining membranes, which are frequently stained with bile. The left lobe is in a similar condition, and in both the abscesses extend throughout the thickness of the organ. Thus, the only portions of liver-substance which are found comparatively free are the lobus quadratus and

that portion of the organ lying immediately above and a little to the left of the gall bladder. These parts on section are of a dark colour, lobules distinct, small bile vessels very evident. The gall-bladder is small, contains about three drachms of a clear, somewhat viscid secretion. On pressing it and along its ducts no fluid could be forced out at the papilla biliaria. It was with much difficulty that a probe could be passed along the cystic duct, owing to an unusual number of irregular folds in the mucous membrane, which are evident on slitting up the duct. The common bile duct itself is patent, the mucous membrane of its upper two-thirds stained with bile. There are no clots in the superior mesenteric, gastric, or splenic veins. On slitting up the portal vein itself, a small abscess is found projecting into the calibre of one of its right divisions. The tissue in the neighbourhood of these main divisions is infiltrated with pus.

A firm nodule was felt at the portal fissure and mistaken at first for a bunch of lymph glands. Section of this, however, showed it to be distinctly laminated, and careful dissection of the part revealed the existence of an *aneurism* just at the bifurcation of the Hepatic Artery, but occupying chiefly the right branch (see frontispiece). The dilatation begins immediately beyond the gastro-duodenalis (*d*), and extends for about three inches as a somewhat conical swelling. The left hepatic artery (*c*) arises from the obtuse end of the aneurism and is unaffected. At the thickest part its circumference measures three inches. For 2½ inches it passes to the right and gives off two branches (*f*) which appear occluded, then turns at right angles and passes backwards for 1½ inches towards the posterior border of the liver, terminating by a conical extremity which is continuous with the main branch of the artery. The arteries of the body had been injected, and the red mass is found in the trunk of the hepatic before

its bifurcation, in the gastro-duodenalis, and the left hepatic branches, all of which are full and tense. The hepatic artery appears to enter the aneurism about ¼ of an inch from the obtuse end, the gastro-duodenalis and left hepatic being given off apparently from the dilatation itself, and on slitting up the hepatic artery it appears at first sight as if these were its only branches, and that its communication with the aneurismal sac had become obliterated. Careful inspection, however, of the lower and posterior wall reveals a small canal, the calibre of a hypodermic needle, which leads directly into the sac. The aneurism being opened by a longitudinal cut on the upper surface, it is seen that the anterior third, comprising the rounded end, is completely filled with firm decolorized laminæ of fibrin, concentrically arranged. The middle third of the sac contains semi-coagulated blood and red injection mass, after emptying which there is seen a cavity about the size of a small walnut. This is in communication with the hepatic artery by the small canal already referred to, which passes for rather more than half an inch through the fibrinous laminæ of the anterior end. Two small branches, both containing injection, pass from the cavity, one, the cystic, (*e*) going to the gall-bladder, the other, a somewhat larger branch, passing to the central part of the organ. The sac is lined with sheets of fibrin which at the under part are thinner than elsewhere, and at this point the blood has infiltrated the proper coats of the aneurism, which, in consequence, look reddish black. The terminal portion of the sac lies chiefly in the substance of the right lobe, surrounded by suppurating hepatic tissue, which had to be dissected away to expose it; and on section the cavity is found almost completely obliterated by fibrinous laminæ, which in the centre are softer, and not so colourless as at the other end of the sac. No direct passage could be traced through this from the central cavity, and the main

the hepatic artery, it is easy to understand that in cases of thrombosis of the portal vein, even where the obstruction is complete, the functions of the organ may be maintained, and both bile and glycogen secreted; for the capillary plexus of the lobules continues to receive through the interlobular veins the blood which has been emptied into the latter from the venules of the hepatic artery. The nutritive blood serves as a substitute, acts vicariously, for the functional. It has been maintained, and the statement passes current in the text-books, that the converse of this is true, viz: that the portal blood can replace the hepatic, the functional act for the nutritive. This view is based on experiments made upon the lower animals.

Schiff states that in the cat the functions of the liver are performed just as well after ligature of the hepatic artery as before; and Betz found that in the dog, after tying the trunk of the hepatic and all the collateral branches, no important alteration took place either in the structure of the liver or in its secretion.

Cohnheim and Litten have shown, however, in a very important paper on "Disturbances in the Circulation of the Liver," (Virchow's Archiv. May, 1876), that in experiments on dogs arterial blood still reaches the liver even after ligation of the hepatic, the coronaria ventriculi, and the gastro-duodenalis, owing to the very extensive anastomoses and connections of these vessels. In the guinea pig, on the other hand, the supply of arterial blood can be completely shut off, either from the whole organ or from individual lobes. In the former case the operation is always fatal within 24 hours, and even in this time important changes are found to have taken place in the organ. These are all the more marked if, instead of ligating all the arteries, only the one going to the extreme right lobe be tied. The result is an entire necrosis of the portion of the liver supplied by the ligatured

artery, and in every instance the animal died within two days.

Cohnheim states that pathological proof of the correctness of this view is as yet wanting, but I am inclined to believe that by this case the deficiency is supplied; for I think the suppuration of the organ best explained on the view, that the shutting off the supply of blood, either by the gradual occlusion of the aneurism by clots, or by the quicker process of emboli conveyed away from the interior of the sac, produced numerous areas of necrosis, which subsequently became, by inflammation and a sequestering suppuration, converted into abscesses. It is impossible to determine, in the absence of any positive evidence, whether the process resulted from emboli or simply by the gradual obliteration of an important blood channel; and in any case there are certain difficulties which will occur to the minds of many in the view here suggested. There are at least two cases on record of total obliteration of the artery without consecutive suppuration, one of which was from aneurism. Still, this, if occurring gradually, and not involving the pylorie artery, need not necessarily, as the above-mentioned experiments prove, deprive the liver of arterial blood. There is no reason to suppose that the obliteration in this case did not occur slowly, for the fibrinous laminæ, especially at the anterior end, were firm and tough. Again, on an embolic theory it might be urged that in this instance the emboli, consisting of fibrinous shreds from an aneurismal sac, should have produced simply mechanical effects, infarctions, and not, as in the case of emboli proceeding from necrotic or suppurating foci, abscesses. Mechanical emboli do, however, sometimes produce suppuration, and in the liver might do so by causing death of the structures supplied by the obstructed arteries, viz: the portal vessels, bile ducts, and connective tissue of Glisson. In the present case, sup-

posing the process to depend on emboli, there would be arterial blood enough sent through collateral branches to furnish material for an active suppuration about the necrotic centres. Altogether, the embolic theory meets the case better than any other. It is to be remembered also, that the disease was not rapidly fatal, but came on slowly, lasted five weeks or more, and it is not unlikely that during this time much of the fibrin was deposited, and the obliteration of the distal end of the aneurism took place. This is rendered still more probable by a consideration of the condition of the left hepatic branch, the commencement of which is involved in the aneurism, but which now, owing to the filling of the proximal end of the sac with fibrin, appears to be almost the direct continuation of the main trunk. In fact, for a short distance from the bifurcation, the upper wall of the left branch is made up of condensed fibrin, which is grooved by the blood channel. This explains, too, the occurrence of the abscesses in the territories supplied by the left branch. The almost entire obliteration of the obtuse end of the sac occurred, most probably, after the mischief had been started by the escape of emboli. The appearance of the abscesses adds further support to this view. None of them looked recent or contained shreds of necrotic liver tissue, but all were filled with a creamy pus, and had walls lined by definite pyogenic membranes.

There is no clue to the origin of the aneurism itself. The age of the patient, and the absence of arterial degeneration elsewhere, are almost sufficient to exclude atheromatous degeneration as a cause, and the walls of the sac appear thinned but not evidently diseased. Of other agencies capable of producing aneurism, especially of smaller vessels, embolism is the most important, and, even in the absence of valvular disease, and remembering the unfavorable position of the hepatic artery for emboli, we are inclined to regard it as the most probable cause.

It is scarcely possible, considering the situation of this artery, that strain could have had anything to do with its production.

CASE XLVIII.—*Aneurismal dilatation of branches of pulmonary artery on the walls of phthisical cavities. Death from hæmoptysis.*

J. L., æt. 44, ill for some time with phthisis, died unexpectedly of hæmorrhage from the lungs.

Lungs.—Seven cavities, in size from a walnut to a small orange, found throughout the organs, chiefly in the upper lobes. Five of these contain blood with clots. Caseous masses numerous, and here and there small tubercles. On section of the lower lobes, irregular areas of a darker colour are noticed on the congested surface, which on inspection are seen to be small bronchi filled with clots, the lung tissue about them being deeply stained. On slitting up the branches of the pulmonary artery three aneurismal pouches, the size of peas, are met with in vessels running on the walls of cavities. They appear to be simple diverticula of the vessels, the intima being continued into them. From the side of the cavities they look like little irregular swellings on the wall. The origin of the hæmorrhage was not discovered, though all the branches of the pulmonary artery in the right lung and lower lobe of the left were slit up. The vessels of the upper lobe of the left lung were, by mistake, not examined.

No doubt the hæmorrhage in this case was due to the rupture of one of these small aneurisms—the cause of the hæmorrhage in most of the cases of death from hæmoptysis in chronic Phthisis. (See Ramussen, Edinburgh Medical Journal, 1868, and Powell "Trans. Path. Soc." xxii.)

CASE IX.—*Aneurism at second bifurcation of the right middle cerebral artery. Rupture; extravasation of blood into*

the Sylvian fissure, and laceration of substance of the temporo-sphenoidal lobe. Death in 36 *hours.*

Mrs. R., æt. 40. See report of case by Dr. Bell.—*Can. Med. and Surg. Journal*, August, 1876.

Post mortem, 11 hours after death.

Body that of an average sized, poorly nourished woman.

Head.—Nothing special noticeable about the soft parts or the calvarium. Veins of the pia mater moderately full of blood; sub-arachnoid fluid scanty. In the removal of the brain, clots are met with in the neighbourhood of the middle fossa of the base of the skull on the right side, and they are seen to have proceeded from a large extravasation which had taken place in the right Sylvian fissure. The convolutions of the middle lobe in the vicinity are considerably lacerated, the brain tissue broken down and replaced by a dark clot. About a handful of coagulated blood was removed, most of which was in and about the Sylvian fissure. Only a thin layer of blood exists at the base, around the optic commissure and perforated spaces. A delicate coagulum also extended over the convolutions in the lateral region on the right side. The circle of Willis and middle cerebral artery were removed for subsequent examination. The substance of the brain appears healthy; the ventricles are empty, and nothing abnormal is observed about the ganglia at the base. On carefully washing away the clots from the right middle cerebral artery, the source of the hæmorrhage was ascertained to be a small aneurism, situated in the fork of the chief bifurcation of the vessel. This had ruptured, and the blood had escaped through a large ragged orifice. The remaining vessels of the brain were found healthy, no atheromatous change being detected in their walls.

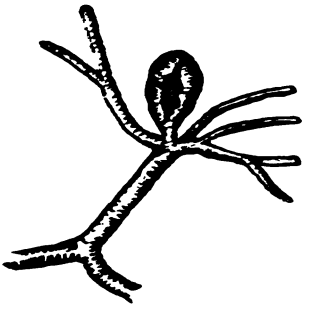
Abdominal organs healthy; no affection of the kidneys.

A beautiful false corpus luteum was found in the left *ovary* (she had menstruated exactly three weeks before), measuring fully $\frac{1}{8}$ of an inch in diameter, and with a pale

yellow convoluted wall. The central coagulum was of a dark red colour. In the same ovary at the other end was a small corpus luteum about ⅛ the size of the large one, with a decolorized coagulum and much more convoluted wall.

Uterus somewhat enlarged. Mucous membrane appeared congested and tumefied.

The situation, size and appearance of the rupture are well shown in the annexed wood-cut.



Respiratory System—Trachea.

Case LXI.—*Ossification of greater portion of mucous membrane of trachea.*

This curious condition was met with in a case of Addison's Idiopathic Anæmia.—(See *Can. Med. and Surg. Journal*, March, 1877.)

J. A., æt. 47.

Trachea.—Beginning just below the cricoid cartilage, and extending to the bifurcation, the mucous membrane is represented by irregular ossific plates, which towards the front of the tube and near the main bronchi form a continuous bony membrane. The free surface is denuded and very rough, numerous pits and projections alternating with each other. Towards the bronchi the ossified membrane is thicker, and firmly united to the subjacent cartilages.

LUNGS.—*Pneumonia.*

Of 14 post mortems in cases of pneumonia the following are of special interest.

CASE X.—*Pneumonia of the upper lobe of the right lung; extensive meningeal inflammation.*

H. F., æt. 38. In hospital four days. For clinical report, see *Can. Med and Surg. Journal*, August, 1876.

Lungs.—The upper lobe of the right lung, with the exception of the anterior and lower borders, is in a state of red hepatization. The bronchial tubes of the consolidated area are uniformly filled with fibrinous plugs. The other lobes of this, and the whole of the left lung, are engorged, much blood and serum escaping on section. Scattered over the visceral pleura of both lungs, chiefly at the base, are small, white, firm granules, feeling to the touch like small shot, and resembling miliary granulations. Some of them are flatter, others are situated upon fibroid bases, and on examination they prove to be fibrous outgrowths of the pleura.

Brain.—On removal of the dura mater, the longitudinal fissure is seen filled with yellowish-white lymph, and the Sylvian fissures are in the same condition. A thick layer of lymph exists about the optic nerve, extending over the perforated spaces to the pons, and on either side to the under surface of the temporo-sphenoidal lobes, and posteriorly over the medulla and contiguous portion of the cerebellum. A considerable amount of greenish-yellow lymph exists over the superior convolutions of the frontal lobes, and the same is seen in small quantities upon the parietal convolutions. Upon the left occipital lobe is a thin layer of extravasation. The vessels of the pia mater are moderately full. On section the white substance is glistening and moist. Fornix and septum exceedingly soft. Ventricles contain a moderate amount of fluid,

thickness. Left lung much engorged and œdematous. Right lung weighs 3 lbs. 6½ ounces; left, 1 lb. 13 oz.

Remarks.—Throughout the past winter pneumonia prevailed to an unusual extent, and was very fatal, especially to elderly and debilitated persons. Ten fatal cases occurred in the General Hospital, some of which, as above recorded, presented very interesting pathological features. Foremost among these is the case complicated with simple meningitis, a rare, and, from a clinical stand-point, puzzling complication, the pneumonic symptoms being masked by the cerebral phenomena, and rendered liable to be over-looked. It is interesting to note that the pneumonia was of the upper lobe, a situation which, when affected, appears more liable to be accompanied with brain symptoms, delirium, &c.

The complication of diphtheritic or croupous colitis in pneumonia is not referred to in any of the text books on Pathology or Practice of Medicine which I have consulted. Dr. Bristowe* was the first, so far as I can learn, to call attention to this condition, which he found in two out of 30 cases of secondary pneumonia, and in four of 16 cases of the primary disease. The distinct false membrane on the mucous surface of the cæcum in the above case corresponds with his description of the early stage of the affection, and represents a condition in the large bowel known by the name of pellicular or diphtheritic colitis, which occurs sometimes as an idiopathic affection, but more frequently is secondary to some other disease. I find no mention in any of the works at my disposal of the large rupia-like masses of exudation scattered singly and in rows upon the mucous membrane.

Several of the autopsies suggested a practical point of much importance, viz., the propriety of bleeding in cer-

* Transactions of the Pathological Society of London. Vol. viii. p. 66.

tain cases. Thus, for example: A young man, aged 20, full-blooded, died of pneumonia on the 5th day. At the autopsy, right heart and venous system gorged. Left lung uniformly solid, in a condition of red hepatization, its tissue dry, containing but little blood; right lung in a condition of acute œdema, the surface on section bathed with bloody serum. Death most probably resulted from the vain effort of the right heart to send a certain volume of blood through an area of pulmonary capillaries reduced one-half by disease; in consequence the blood pressure was nearly doubled in the normal capillaries, transudation of serum under the increased lateral pressure occurred and a suffocative œdema terminated the case. The reduction of the volume of blood by a copious venesection would have restored the natural equilibrium between the circulating fluid and the pulmonary capillaries; just as nature gradually adjusts it in the case of a consumptive, with more than one-half of these capillaries destroyed.

Gangrene.

CASE XII.—*Phthisical cavities in left lung; gangrene of pulmonary tissue about one of them.*

H. L., æt. 38.

Lungs.—Occupying the back part of the left lung at the middle third of the upper lobe is an area of gangrene, the size of a large orange. It is situated immediately beneath the pleura, and was perforated by the finger in the removal of the organ. On section it is found to consist of dark, exceedingly fœtid, decomposing lung tissue, which, after pouring a stream of water upon it, adheres to the vessels and bronchi as irregular shreds. The lung in the immediate neighbourhood is consolidated, and several small cavities and caseous nodules are present in the other lobes.

Bronchial tubes contain an offensive mucus, and the membrane is very dark-coloured.

Phthisis.

Of twelve cases, three only are worthy of notice.

CASE XXXVIII.—*Fibroid contraction and induration of entire right lung, cavity at apex. Displacement of heart; hypertrophy with dilatation of right chambers.*

For clinical history see *Can. Med. and Surg. Journal*, Feb. 1877.

Lungs.—Right, universally adherent, and removed with difficulty; organ firm, solid, and to the touch gives no indication of crepitation. On section no trace of the lobes remains. A large cavity occupies almost the entire apex, situated chiefly in the antero-lateral region, the posterior wall being composed of irregular fibroid masses through which two or three large bronchi open directly into the cavity. The upper and antero-lateral walls are made up of a layer of fibrous tissue 1–2‴ in thickness, the outer part white, the inner portion darkly pigmented. Two irregular prolongations from this cavity extend downwards and forwards towards the anterior margin of the lung, and another narrow one extends for two inches along the posterior part of the organ, immediately beneath the pleura, which is here thin. The lining membrane of these cavities is dark red in colour, and traversed by numerous bands, the remnants of bronchi and blood-vessels. The base of the organ is firmly united to the diaphragm, and the portion which is received into the angle between this membrane and the ribs is, for the extent of 1½″, transformed into a mass of white fibroid tissue, devoid of any trace of lung substance. Between the upper margin of this fibroid area and the cavity at the apex—a distance of 3″—the lung presents a marbled appearance, is dense, firm, and with the exception of one small spot close to the root, airless; a few small dilated bronchi are evident below, while immediately beneath the pleura are one or two inconsiderable cavities filled

with a bloody and purulent matter. The anterior border of the organ is in the same condition, and on section numerous small cavities (some of which are dilated bronchi) with bloody contents are seen. The organ is not excessively pigmented. The main bronchus and its branches of the 2nd and 3rd degree are somewhat dilated. Bronchial glands firm, not enlarged, moderately pigmented.

Left lung adherent at the apex only. On section a large irregular cavity with thick dense walls occupies the upper and anterior part of the apex, the lining membrane of which is hæmorrhagic. The remainder of the organ is extensively emphysematous, especially at the anterior border, but presents no other degenerative signs.

Heart.—The cavities of the right side much dilated and full of blood, walls of right ventricle appear somewhat thickened. Tricuspid orifice dilated, admitting four fingers nearly to the second joint. Segments of the valves a little thickened at the edges. Musculi papillares look elongated and the apices are fibroid.

CASE LXXXI.—*Chronic phthisis.—Perforation of the lung —Pneumothorax. Dermoid cyst of right ovary.*

J. S., æt. 21.—On opening the abdomen the liver is seen to be displaced downwards, the upper border corresponding to the lower margin of the ribs. On penetrating the right pleural sac a considerable amount of air rushed out. 18 ounces of a clear, serous fluid in this cavity.

Lungs.—The left upper lobe is riddled with cavities; the lower lobe is slightly crepitant, and contains numerous caseous and tubercular nodules. Upper and middle lobes of right lung almost airless, except at free border; lower lobe collapsed. No adhesions except at extreme apex The visceral layer of the pleura of lower lobe is covered with patches of lymph. At the upper and posterior part of this lobe, about an inch from the root of the

lung, and the same distance from the upper lobe, there is a small oval perforation, $2\frac{1}{2}'''$ by $1\frac{1}{2}'''$, through which air bubbles on pressure. For a couple of lines about the orifice the pleura is pale; beyond this the membrane is injected and covered with recent lymph. The perforation does not lead into a definite cavity, but into a rapidly softening portion of lung, infiltrated with pus, and in parts quite diffluent.

CASE LXXXII.—*Chronic Phthisis. Cancer of the vertebræ and ribs.* Reported under Osseous System.

PLEURA.

Small fibroid thickenings on visceral layer.—In three instances localized fibrous outgrowths of the pleura have been noticed, much resembling miliary tubercles in size and general appearance. The first case in which they occurred was that of pneumonia complicated with meningitis, and the note with reference to them in the *post mortem* book is as follows: "Scattered over the surface of pleura of both lungs, chiefly of lower lobes, are small, white, firm granules, feeling to the touch like small shot, and resembling miliary granulations. Some of them, however, are flatter, not granular, and they may be simple fibroid thickenings of the pleura." Such they proved on examination to be. They occurred in a case of cancer of the liver, though not so abundantly, on the pleura covering the left lung; and a third time on the pleura of the upper lobe of the left lung in a case of pneumonia. They are found chiefly on the interlobular tissue, sometimes as shot-like elevations on small opacities of the membrane.

These are of interest on account of the resemblance they present to miliary tubercles; so much so that an experienced pathologist seeing them in the first case, raised a question as to the nature, whether simple or tuberculous, of the meningitis accompanying it.

Inflammation.—Of fifteen cases in which the membrane was affected, thirteen were simple in character, and

accompanied with a variable quantity of exudation; the other two were cases of empyema.

In the following cases the effusion was enclosed in pockets, and though, for convenience, the chest was tapped, post mortem, the whole of the fluid could not be drawn off.

CASE LXVII.—*Pleurisy: Fatty and fibroid Heart.*

A.B., æt. 63.

Right Pleura.—By tapping, about seven pints of clear citron-coloured fluid were withdrawn. On removing the sternum a definite pocket is found from which the fluid had been removed. The upper wall of the cavity is formed of a layer of tenacious lymph. Another smaller pocket exists in the upper and back part of the pleural cavity.

CASE LXXXVIII.—*Suppuration of portal vein. Empyema.*

A. B., æt. 40.

Left Pleura.—About 54 oz. of pus in this cavity. Anteriorly it is contained in two pockets, one the size of a large orange immediately at the apex, the other corresponding in position with the third and fourth ribs, just external to the cartilages. This latter pocket communicates by a small round orifice with the general cavity, which occupies the lower and whole of the back part of this side. The pus was withdrawn from the latter without affecting in any way the contents of the cavity at the apex and not entirely emptying the other one.

GASTRO-INTESTINAL SYSTEM.

TONGUE.—*Epithelioma.*

CASE XLV.—*Epithelioma of right side of Tongue, extending from base to near the apex. Removal of organ with galvanic ecraseur. Suppuration beneath cervical fascia. Pyæmia.*

J. L., æt. 36.

The tissues of the neck behind the deep fascia, principally on the right side and in front, are uniformly infiltrated with pus, which extends also to the anterior mediastinum. There is no definite collection of pus.

Lungs.—Left, healthy looking. Middle and part of the upper lobe of right are firm to the touch, non-crepitant, and the surface section is bathed with a sero-sanguineous fluid. A small purulent focus exists at external part of middle lobe, not an accumulation of pus, but an area 1″ by ¾″, irregularly infiltrated.

CASE XLII.—*Epithelioma of Tongue. Secondary nodules in liver.*

A. B., æt. 72.—Tongue almost entirely eaten away by the cancer, the base only remaining. The tissues in the neighbourhood are involved and the internal surface of the lower jaw on both sides is much eroded. Epiglottis and larynx not affected. The *liver* contains three masses of secondary cancer. the largest the size of a horse chestnut, situated superficially and presenting the usual characters of these growths.

The *lungs* present caseous masses at the apices. *Heart* somewhat atrophied. *Spleen* very small, weighing scarcely two ounces.

PHARYNX.—*Miliary Tuberculosis.*

CASE LXXX.—*Chronic Phthisis. Miliary tubercles in lungs and pharynx.*

A. G., æt. 22. *Lungs*: upper lobes riddled with communicating cavities, one of which, the size of a small egg, is filled with a clear, somewhat viscid, jelly-like material. Numerous tubercles and caseous nodules in the lower lobes.

Pharynx. — Scattered over the posterior and lateral walls are numerous, small, firm, granulations, which on examination prove to be miliary tubercles. They are con-

fined to the pharynx. There is no ulceration and the larynx is not involved. With the exception of two suspicious spots in the cortex of the right kidney, the other organs are unaffected.

In another case of chronic phthisis the same condition of the pharynx was observed, and without ulceration.

These cases are of interest as showing the existence of extensive miliary tuberculosis in the pharynx without ulceration, and without involvement of the larynx. The condition is by no means common in phthisis. Attention has recently been directed to this subject in an able article by Frankel.*

Œsophagus.

Post-mortem digestion.—In CASE LXIX, a man dead of Typhus fever, an oval perforation of the œsophagus at the posterior wall, just above the diaphragm, was found. It extended 1½″ in length by ½″ in breadth; the edges thin, dark in colour, not at all congested. A small amount of fluid was in the tissues of the posterior mediastinum. The stomach contained semi-digested food, and its mucous membrane was softened.

Stomach.—*Cancer.*

CASE XXIV.—*Cancer of the cardiac orifice, involving the œsophagus. Secondary masses in other parts of the organ.*

M., H., æt. 52. *Stomach.*—The cardiac orifice is blocked by irregular cancerous projections from the mucosa, so that the tip of the forefinger is with difficulty introduced. The growth appears as an annular ring, extending for about an inch above and below the orifice. The walls are here much thickened, and the distinction between the coats lost; the surface of the cancer is much ulcerated. For a distance of an inch or more the mucous membrane

* Ueber die Miliartuberculose des Pharynx. "Berliner Klin. Wochenschrift," Nos. 46 and 47, 1876. (See CAN. MED. AND SURG. JOURNAL, Feb. 1877).

of the lesser curvature appears healthy, but between this and the pylorus is a long, flat, cancerous mass, not ulcerated. A string of projecting nodules extends along the greater curvature, and on the posterior wall is a thick, flat mass beginning to ulcerate on the surface.

The growth corresponds in histological characters with medullary cancer. No secondary masses in any other organ.

CASE LXII.—*Medullary Cancer, involving the pyloric zone of the stomach. Perforation, peritonitis.*

F. M., æt. 33, had had for some time indefinite gastric symptoms, accompanied with occasional attacks of vomiting. There was no tumour to be felt externally. He left the hospital, to return a short time after in a condition of collapse.

Abdomen.—Intestines of a bright red colour and covered here and there with flakes of lymph. The omentum is pushed up and lies beneath the costal cartilages. On separating the transverse colon from the stomach, a round perforation about the size of a sixpence is seen in the latter, through which the contents escape.

Stomach.—On opening the organ a large, irregular, cancerous mass, about 2½″ in width, extends around the pyloric zone, but does not involve the orifice. In the centre of this, corresponding to the lower and anterior part of the greater curvature, is a round perforation, the margins of which are thin and of a dark colour. The cancer is moderately firm, much raised, the surface ulcerated, especially at the lesser curvature. Though it contains a considerable proportion of fibrous elements, yet the general character of the growth corresponds rather with the medullary form of cancer.

SMALL INTESTINE.—*Incarceration.*

CASE XCII.—*Passage of two feet of the ileum through a loop attached to the sigmoid flexure.*

M. H., æt. 50, taken ill suddenly with vomiting and symptoms of obstruction, which continued 48 hours, when she died unexpectedly in a condition of coma.

On opening abdomen, a small amount of bloody fluid is found in peritoneal cavity. The intestines are slate-coloured, relaxed, smooth, and present no sign of inflammation. On tracing them towards the cæcum it is found that the lower two feet of the ileum have passed through a loop attached to the sigmoid flexure and have become strangulated, being very dark, in places almost black, as if necrosis of the part was beginning. Careful examination of the constricting band shows that it is connected by both ends with the sigmoid flexure, and is composed of fatty and fibrous tissue, in structure looking very like the glandulæ epiploicæ near it. At its upper part, and near the attachment, it is broad, but the part farthest from the large bowel is exceedingly thin. The intestine passes through on the side of the ring next the sigmoid flexure, the lower end of the ileum being uppermost, and nipped about 1½″ from the ileo-cæcal valve. The mesentery passes through on the right side, and at and about the constriction is very dark. The diameter of the ring is about an inch. It is remarkable that though the strangulated portion of the bowel was dark and congested, yet there were no signs of inflammation, nor any lymph upon the peritoneum.

Nothing abnormal in other organs.

Ulceration—Simple.

CASE XCI.—*Round ulcer of duodenum.*

M.G., æt. 12, dead of bronchitis and pulmonary collapse. About 1½″ from the pylorus, on the posterior wall

of the duodenum, is a distinct ulcer the size of a three-penny bit, with slightly raised edges, lying between two valvulæ conniventes.

Nothing else abnormal in the intestines.

In two instances—one a case of grey degeneration of the cord, the other a case of cancer of the uterus—there were simple round ulcers in the ileum.

Typhoid Ulceration and Perforation.

Of seven autopsies in typhoid fever the following are of interest:—

CASE II.—*Perforation of typhoid ulcer during convalescence, owing to an indiscretion in diet.*

A. P., æt. 18, a convalescent for nearly two weeks, during which time the temperature had been normal. A day or two before his intended discharge he ate several mutton chops, and within 24 hours was in a state of collapse from perforation.

Abdomen.—Coils of small intestine of a rose-red colour; several pints of a dirty fluid, mixed with fæcal matter, in the peritoneal cavity. A few flakes of lymph on some parts of the ileum, but the congestion is confined to the coils near the abdominal walls. On carefully examining the intestines a small perforation is seen, situated about eight inches above the valve, and through it fæcal matter exudes. On slitting up the ileum the perforation is found at the bottom of an ulcer about the size of a copper. It is button-hole in shape, 4‴ in length, 2‴ in breadth, and looks like a small transverse rent in the muscular coat. There is no inflammation about the ulcer, but it and the others in the bowel appear to have been healing.

CASE XXVIII.—*Perforation of a deep ulcer at end of second week.*

A. B., æt. 40, had been ill with typhoid fever two weeks; symptoms of peritonitis 18 hours before death.

Abdomen.—Intestines of a vivid red colour, and the general peritoneum inflamed. On carefully working down the coils from the duodenum, no lymph or adhesions are met with until the ileum is reached; on tracing it towards the pelvis, the coils are found matted together and covered with thick greyish-yellow lymph. About a foot from the valve a perforation is seen, fluid fæces of a yellowish colour flowing out, so revealing it.

Intestine.—On slitting up the jejunum and ileum the mucous membrane is found pale, and in the lower two feet of the latter there are six or eight round, deep ulcers, the largest, about the size of a shilling, presenting an irregular perforation. The mucous membrane about the ulcers is not injected, nor are their edges raised.

CASE XCIII.—*Typhoid Fever. Perforation. Peritonitis.*—J. E., æt. 29. In hospital 9 days.

Peritoneum.—Coils of intestine present a vivid red appearance, being covered here and there with flakes of lymph, and stained with fæcal matter. Nearly two pints of a dirty semi-feculent fluid in the cavity. About twelve inches from the valve a perforation is seen.

Intestine.—As the lower part of the ileum is approached there are several ulcers, most abundant in the foot of gut above the valve. Most of these are small and round, not elongated, and have yellowish-stained sloughs adhering to them which, with few exceptions, are only beginning to separate. About a foot from the valve is an ulcer, the size of a shilling, which has perforated. Near the valve are six or eight round, punched-out ulcers, the bases of which are formed by the muscular coats of the intestine. No ulceration in the cæcum or colon.

The following also present features of interest, as showing what a slight amount of intestinal disturbance may accompany fatal cases:

CASE XXXIII.—*Four round ulcers in the ileum. Peyer's patches not generally involved. Slight hypostatic pneumonia.*

A. B., æt. 24, a small feebly developed man. In hospital 8 days.

Intestines. — Several intensely black patches, quite superficial, on peritoneal surface. Mucous membrane of jejunum covered with a flaky, yellowish matter, very closely adherent, and washed off with difficulty. In the ileum, five inches from the valve, there is a somewhat elliptical ulcer, placed rather transversely to the axis of the gut, and about the size of a penny. The base is made up of the circular fibres, and the edges are neither elevated nor congested. Two other smaller ones are situated close to it, and five inches higher up is a fourth, also small, and having a punched-out appearance. The patches above this are not elevated, but have a peculiar mahogany-brown colour, and on close inspection the individual follicles are seen to be a little swollen. The solitary glands are scarcely visible. No ulceration in the large bowel. *Mesenteric* glands moderately swollen.

CASE XXXIV.—*Slight swelling of Peyer's glands, only one small spot of ulceration.*

J. G. æt. 40, a stout man, of intemperate habits. In hospital five days. Temperature moderate, and general symptoms not bad; he had no delirium, but was excessively timid and nervous, so much so that the House Surgeon expressed the belief that he was frightened to death.

Intestines.—Peyer's patches slightly swollen, their bases congested and the follicles in each very distinct. The solitary glands in the neighbourhood of the valve are enlarged. In only one small patch, about a foot from the end of the ileum, is there any trace of ulceration, and on this it is not at all advanced. No affection of the large intestine.

Mesenteric glands a little swollen.

Spleen weighs 15 oz., and is very soft.

Heart.—Right and left segments of aortic semi-lunar valves have merged together, presenting one sinus behind, with an indistinct separation near the attachment to the aorta. Segment a little thickened, but valve appears competent.

CÆCUM.

CASE XXXII.—*Round ulcer of cæcum, perforation, general peritonitis.*

M. G., æt. 19, a well-built young man. In hospital 4 days and a half, with symptoms at first like obstruction of the bowels, subsequently those of peritonitis. Three weeks before he had an attack of what was supposed to be strangulation, from which he recovered.

Abdomen.—General peritoneal surface much inflamed, and of a deep-red colour. On separating the coils of small intestine patches of lymph are met with, uniting them together. A pint of fluid in the cavity. The intestines are swollen and distended, the walls soft and tumefied. The inflammation is much more extensive toward the pelvis and in the neighbourhood of the ileo-cæcal valve. Evidences of a bygone peritonitis are seen in the form of slight opacities and puckerings on the serous surfaces, both visceral and parietal.

Small Intestine.—Mucous membrane tumefied; otherwise unaltered.

Cæcum.—The inflammation about it is most intense, and the lymph most abundant. On carefully separating it a round patch, 2¼″ in diameter, is seen on the abdominal parietes, of a greyish-red colour, and somewhat depressed. Corresponding to the centre of this is a round perforation of the cæcal wall, 1½″ in diameter, the coats of the intestines about it being much inflamed. On slitting up the gut a single ulcer, which has perforated, is seen on the upper and outer wall; its edges are thin, and the mucous

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membrane about much inflamed. Nothing else noticeable in the large intestine.

Remarks.—Perforation of the cæcum is rather an unusual accident, much more so than perforation of its appendix. In this case the trouble probably originated in an attack of the *typhlitis stercoralis* of Rokitansky, induced by the lodgment of hard masses of fæces. There were evidences about the perforation, between the cæcum and iliac fascia, of inflammation (perityphlitis) of an older date than the general peritonitis; and there can be no doubt that it was in the first illness that the perforation happened, its evil effects being limited by a local inflammation, which subsequently, owing to some not ascertained cause, spread to the general peritoneum. There was a very marked contrast between the area of inflammation immediately about the perforation and that towards the head of the cæcum; the former was darker, more greyish in colour, and the contiguous surfaces were not so easily separated. It is important to note, with reference to the diagnosis, that the symptoms appeared to point to obstruction of the bowels; doubtless, a more thorough inspection would have satisfactorily decided the question.

Appendix Vermiformis.

In three cases there were found in it firm concretions of fæcal matter, oval in form, and about the size of date stones. In Case xxviii., mentioned above, its calibre was obliterated for the first half inch of its length, patent for an inch beyond the obliteration. In another case of typhoid fever, it was also partially closed. It was ulcerated in a case of phthisis, chiefly at the cæcal end, which was almost entirely closed by the swelling of the membrane, in consequence of which the tube was dilated with the retained secretions, being nearly the thickness of the thumb.

The following is the only instance of perforation noticed:—

CASE LXXXVIII.—*Abscesses in the mesentery. Suppuration of portal vein. Empyema. Perforation of appendix, general peritonitis.*

J. L., æt. 42. Had had typhoid fever three months previously.

Abdomen.—General peritonitis; 80 oz. of turbid fluid removed; intestines covered over with thick yellow lymph, most abundant on the coils of the ileum and on the pelvic organs.

The *appendix* lies directly over the promontory of the sacrum, and is about the length and size of the index finger. It is much swollen, and the walls soft. On carefully removing it the fluid contents escape from an oval perforation on the under side, which is adherent to the tissues over the sacrum by thick lymph. On slitting up the cæcum, which is healthy, a probe cannot be passed into the appendix, nor can its orifice be seen. From the side of the latter the probe enters a small sulcus which passes for two or three lines beneath the mucous membrane of the cæcum. About $1\frac{1}{4}''$ from the cæcum is a round perforation, $\frac{1}{8}''$ in diameter, the margins thin and dark-coloured. There is no foreign body or concretion.

PERITONEUM.

Acute Inflammation.—In eleven cases of acute peritonitis, the following were the causes:—Three, perforation of typhoid ulcers; one, perforation of cancer of stomach; one, perforation of cæcum; one, perforation of appendix vermiformis; one, rupture of an abscess in broad ligament; two followed the operation of ovariotomy; one, cancer of the liver; and one followed delivery in a woman with Bright's disease.

Tubercular Peritonitis.

CASE VII.—*Acute tubercular inflammation of the peritoneum. Small caseous mass in left lung.—Right-sided pleurisy. General hyperplasia of the bone marrow.*

J. McT., æt. 35.—Had been a soldier for twelve years, latterly a sailor; admitted in September, 1875, complaining of weakness, loss of appetite, and frequent attacks of vomiting. No albumen in urine. Blood normal. Systolic murmur at apex. No enlargement of abdominal organs. Tenderness on deep pressure along right costal border and ensiform cartilage. The vomiting became more marked, and he had occasional attacks of diarrhœa. The symptoms pointed, though vaguely, to disease of the stomach, either round ulcer or cancer. The vomiting was with difficulty controlled, and patient became very weak and anæmic, the skin slightly icteric. Towards January he got so feeble that he was unable to move from bed, and the vomiting was so persistent as to necessitate feeding per rectum. Through January and February the vomiting diminished, but the patient wasted slowly, and the case was regarded as malignant disease, involving perhaps the peritoneum. In the beginning of May the peritonitis became acute and general, and he died on the 25th, profoundly exhausted. For some weeks before death hæmorrhages occurred in various parts of the skin.

Peritoneum, contains 56 oz. of a turbid, slightly bloody fluid, in which are flocculi of lymph. Here and there the coils of intestines are matted together by easily separable adhesions. The transverse colon and stomach are in this way glued together, the former covers also the anterior border of the liver. The entire peritoneum, except the portion over the stomach, is of a dark red colour, infiltrated, sodden, and readily stripped off from the subjacent tissues. Localized patches of lymph occur here and there upon it. The whole membrane presents a great

number of small white areas, flat, not projecting above the surface, and ranging in size from a hemp seed to a split pea. As a rule they are isolated, but occasionally groups are seen. They exist in about equal numbers over the intestines, mesentery, and parietal peritoneum. Beneath the latter are from eight to ten larger white patches, which, on section, have a caseous appearance, are firm to the touch, not encapsuled, and extend to the depth of about ¼". On examination of these small and large white masses, they are found to be almost entirely subperitoneal and composed of aggregations of corpuscles of a lymphoid character, a little smaller than the colourless blood corpuscles, and with one, rarely two, nuclei. In sections through those on the intestinal wall, the corpuscles are seen to infiltrate to some extent the muscular coats. The mesenteric glands are but little enlarged.

Heart; ecchymoses on pericardium, walls flabby, muscle pale, very little blood in the chambers.

Pleura; 35 oz. of turbid fluid in right sac. Visceral and parietal layers congested, and covered with flakes of lymph. A few ounces of fluid in left sac.

Lungs.—Right, crepitant, except at extreme base. Lower lobe collapsed. Organ contains a good deal of serous fluid. Left, upper lobe crepitant, lower collapsed and œdematous. At anterior border of upper lobe is a firm block of condensed tissue, somewhat triangular shaped, which on section is made up of a small cavity, looking not unlike a dilated tube, and one or two caseous knots, the lung for a short distance about being solidified, and of a greyish colour. No miliary tubercles in either lung.

Spleen, weighs 5 oz., unaltered.

Liver, 2lbs. 2½ oz., anæmic, and yellowish in colour.

Kidneys, normal in size, but very firm in texture. In the cortex of the right are several small purulent depots, about which the substance is much congested.

Stomach.—Mucous membrane of normal thickness, but soft and readily torn No trace of cicatrices or tumour. It contains about a pint of fluid.

Small Intestines contain yellowish liquid fæces; walls are thick, owing to an infiltrated, swollen condition of all the coats. Mucous membrane is dark in colour. Peyer's glands not enlarged.

Large Intestine contains large masses of yellowish solid fæces.

Brain presents nothing abnormal.

Medulla of bones.—That of the long bones has a uniform greyish-red colour, nowhere having the yellowish fatty aspect of normal marrow. In the cancellated portions and short bones it has a lighter red colour. On examination there were, (1), red-blood corpuscles, presenting considerable differences in size, some hardly the $\frac{1}{3000}$″ in diameter, and many curiously irregular in form. (2) Ordinary marrow cells, and lymphoid corpuscles, which together with the blood corpuscles constitute the chief mass of the tissue. (3) Nucleated red-blood corpuscles—the embryonal or transitional forms of Neumann, of which in each specimen examined four or five examples were met. They are larger than the ordinary coloured forms and have usually a single nucleus. The colouration of these corpuscles is nearly, if not quite, as marked as in the ordinary forms. (4) Cells containing red-blood corpuscles, of which a few examples occurred. There are no myeloplaques.

Clinically, as well as pathologically, this case presents many points of interest. The prolonged gastric irritation, which was the prominent symptom during the first five months of his illness, receives no suitable explanation in the condition found post-mortem. Are we to suppose the peritoneal trouble to have begun with the onset of the symptoms in September, or were these latter due to some constitutional dyscrasia, upon which the affection of the

peritoneum was grafted, dating only three weeks before death, when symptoms of acute inflammation of the membrane developed? Certain cases of tubercular peritonitis are notoriously obscure, the symptoms pointing rather to disease of some viscus covered by the peritoneum, as the bladder or intestines, than to an affection of the membrane itself: and in this case the gastric trouble may have been caused by the chronic irritation induced during the gradual eruption of the tubercles. The condition, however, at the time of death was rather one of acute peritonitis, as evidenced by the injection and tumefaction of the coats of the intestines, and there was nowhere that matting of the coils together by firm adhesions and tubercular matter which is seen in many cases of chronic tubercular peritonitis; but it is a question whether the recent inflammation may not have been super-added on a membrane already studded with tubercles, though with the exception of the large masses on the parietal peritoneum, they did not look very old.

The anæmia and wasting, together with the gastric irritation, presented a clinical picture, not unlike certain of those constitutional affections dependent upon some profound alteration in the constitution of the blood, such as pernicious anæmia; and the finding *post-mortem* of a condition of hyperplasia of the bone marrow, I at first regarded as lending support to this view, seeking in it the explanation of the deterioration of the blood; for there can be no doubt that alteration in the medulla of the bones may seriously influence the composition of this fluid. Moreover, the peritoneal affection was not what I had been accustomed to see in tubercular conditions of this membrane, for, with the exception of the large masses on the parietal layer, the tubercles were not firm and nodular in character, as is usual with these growths on serous membranes, but had rather the appearance of localized lymphoid infiltrations. Since the occurrence of this case,

however, two other instances of hyperplasia of the bone-marrow in chronic wasting diseases have come under my notice, so that I am now less ready to refer this one to the category of myelogenous affections, but would regard it rather as a case of tubercular peritonitis, silent in its course, and towards the end accompanied by an acute inflammation of the membrane, the consequence probably of a fresh outbreak of tubercles.

The absence of the tubercles in the other organs is a condition which not unfrequently obtains in this affection.

CASES.—*Hypertrophic Cirrhosis.*

CASE I.—*Cirrhosis of Liver, with Hæmorrhage.—Jaundice. Ascites.—Delirium Tremens (?).—Erysipelas of the head.*

J. H., æt. 44, intemperate habits, admitted to the Hospital April 30th, 1870, with jaundice, diarrhœa, and delirium. He had been seen by Dr. Roddick a few days before, when he complained of pain in the region of the liver, and great enlargement of the organ was then detected. Nothing definite could be obtained as to the duration of the jaundice, for he was incoherent, and had no friends. Shortly after admission he was attacked with erysipelas of the face and scalp, to which he succumbed rapidly on the 4th of May.

At the autopsy the body was found to be well nourished and of fair muscular development. Skin moderately jaundiced. Several purpuric spots noticed.

Brain.—Healthy.

Abdomen.—No fluid in peritoneal cavity. Liver projects considerably below the margin of the ribs.

Thorax.—No fluid in pleural cavities. A few extravasations on the visceral leaves.

Heart.—Slight thickening of the mitral segments and some atheroma at the bases of the aortic semi-lunar. Otherwise healthy.

Lungs, — Crepitant, except lower lobe of left lung, which is collapsed.

Spleen.—Weighs 19 oz,, (538.46 grammes). Capsule a little thickened and puckered. Pulp soft.

Kidneys.—Right, 9½ oz.; left, 8 oz., of a greenish-yellow hue. Collecting tubules of the pyramids full of urates and bile pigment.

Stomach, — Contains ʒ vi of semi-coagulated blood. Mucous membrane dark-coloured, swollen in places and congested.

Intestines, dark, and contain a small quantity of altered blood. Large veins not particularly full, but the mucous membrane is reddened.

Liver weighs 6lbs. 11½ oz., (3053 grms), and is uniformly enlarged. No adhesions, or fibroid thickenings in capsule. Surface of organ of a dark olive-green colour, and studded with small granulations, half the size of a pea and larger. These little projections have a greenish-yellow appearance, while the intervening tissue is white. On the under surface of the left lobe the largest nodules are seen. The organ is very firm, and cuts with resistance, the surface of section presents a deep, greenish-yellow colour, while the lobules are separated by strands of white connective tissue. The portal vein is large, appearing even dilated.

The gall-bladder is elongated, filled with inspissated bile, which towards the orifice of the cystic duct has collected into three consistent but easily broken balls, which completely close the orifice. The mucous membrane of the ductus communis choledochus is somewhat swollen, but the bile ducts do not appear to be dilated.

Microscopic appearances.—Sections under a low power present islets of liver substance surrounded by a connective tissue rich in nuclei, which in most of the specimens examined almost equals in amount the liver substance. The limit between these two elements is rarely well defined, but there is a gradual blending of the one

with the other. In certain lobules the invasion is uniform and intercellular, groups of two or three cells being separated by a nucleated growth; but in most the invasion is peripheral, and lobules in all stages of destruction may be seen with the liver cells in the central parts still in close contact with each other.

The *connective tissue* differs in no respect from that seen in ordinary cirrhosis, save that the nuclei are perhaps more abundant in proportion to the fibroid tissue. Only in the central parts of wide areas is there an indistinctly fibrillated appearance, and here the nuclei are scattered, while in the neighbourhood of the lobules themselves the tissue is more embryonic in character, and the nuclei predominate, in some spots being crowded together with little or no intervening material. The method of invasion can be traced in all its stages, the new growth creeping in, as it were, from the periphery between the cells, sometimes separating them in rows, but frequently surrounding individual cells or groups of two or three. This appearance will, of course, vary with the direction of the section; if at right angles to the central vein of the lobules the appearance is of fibrous bands passing in from the periphery, while if parallel to the central vein, cells, or groups of them, are separated by an intervening tissue, rich in small nuclei. Such is the condition of the external zone of most of the lobules. There is no definite limit between the two constituents, such as is commonly seen in the atrophic form of the disease, where strands of fibrous tissue encircle and constrict lobules, and the boundary between the two is often, as in specimens before me, clearly defined. This was rarely to be found in the case under consideration.

The *liver cells* do not present any remarkable alterations. In lobules not much involved in the sclerosis, they appear quite natural, but in the affected areas they are stuffed with yellow pigment grains or oil drops, frequently a

combination of the two. The fatty infiltration is not extensive and is very unequally distributed, being marked in some lobules and absent in others. In the periphery of the acini, cells in all stages of atrophy may be seen, some appearing flattened, but the majority look simply diminished in size. Where the central part of a lobule, containing 40 to 50 cells, alone remains, the whole process can be distinctly traced. In the outermost part little groups of yellow granules are seen in the fibroid tissue, in the next zone small cells filled with these granules occur, separated by numerous nuclei, while in the central part are 10–15 cells, the outlines of which are still distinct, the nuclei well marked, and the bile pigment not so excessive in amount. In various sections numerous fine specimens of bilirubin crystals occurred, scattered among the cells.

Here and there in the extra-lobular tissue *biliary canaliculi* are seen, made up of rows of cuboidal cells, enclosing a very narrow tube. They do not appear to be specially numerous, certainly not more so than in sections of a well-marked specimen of atrophic cirrhosis obtained a short time since from the body of an old toper.

The recognition of a distinct variety of cirrhosis of the liver accompanied with enlargement, has only been made within the past few years, owing in a great part to the labours of certain French Pathologists. When the specimen came under observation it appeared to be such an anomaly that the standard authors were ransacked for information, but in vain; the only references to an increase in volume of the organ in cirrhosis related to the initial stage of the disease and as a consequence of fatty infiltration. Happily, just at the time, a number of the *Revue des Sciences Médicales* came to hand, with a condensation of M. Hanot's Thesis on Hypertrophic Cirrhosis, in which he seeks to establish this as a special variety of the disease, characterized clinically by enlargement of the

organ, prolonged jaundice, and the absence of ascites, and pathologically by the fact that the affection originates about the bile ducts, and leads to an increase, not a diminution, in the size of the organ. Cornil and Ranvier* describe the histological condition, and support this view of the origin of the disease. In a recent number of the *British and Foreign Medico-Chirurgical Review*† there is an excellent resumé of the papers on the subject, and the writer agrees in the main with Hanot.

The chief histological differences between this and the common form of cirrhosis appear to be that the growth surrounds single lobules rather than groups of them, and tends more to invade the acini, and that greater numbers of the so-called biliary canaliculi are found in the extra-lobular connective tissue. As will be seen in the above description, the first of these characters is well marked in our specimen, but the second is not so decided.

The clinical history of the disease in this instance, so far as known, corresponds with that of the cases recorded by Hanot. The liver exceeds in weight any of the specimens mentioned in the authorities referred to.

Syphiloma.

CASE V.—*Syphilitic ulceration of left frontal bone. Large node on left tibia. Gummata in Liver.*

T. M., æt. 24, admitted May 4th, with syphilitic disease of frontal bones, and died of erysipelas of the head on the 16th.

Liver weighs nearly 5lbs., and is elongated in the transverse direction. Left lobe much flattened, measuring 8″ from anterior to posterior border, the right lobe at the gall-bladder measuring only 6″. Capsule much thickened, especially about the longitudinal ligament. Five pucker-

* "Manuel d' Histologie Pathologique," p. 922.
† July, 1877.

ed cicatrices are seen on surface of the right lobe, and some small extravasations exist beneath the capsule. On section of the organ from right to left three gummata are seen in the substance, each about the size of a large walnut, two corresponding to cicatrices in right lobe. Each presents a firm, white, central area, which cuts with resistance, and a capsule of fibrous tissue, which towards the liver substance is not well defined, but blends insensibly with it, and at this part is more translucent. Four others presenting similar characters are seen; two, the smallest, in the left lobe. Microscopically the central portions show an indistinctly fibrous appearance, at the periphery the fibres are more marked, while the zone in the immediate neighborhood of the liver substance shows a small-celled growth involving the lobules.

The other organs presented nothing abnormal.

Cancer.

CASE LV.—*Primary Cancer of the Liver. Ascites. Jaundice—Secondary mass in tail of Pancreas, small secondary nodules in Kidneys.*

A. B., æt, 65, in hospital for several months. Body much emaciated. Abdomen distended. Skin moderately jaundiced.

From the peritoneal cavity 250 oz. of bile-stained serum were removed. Intestines slate coloured, and here and there small flakes of lymph are seen upon them. The descending colon passes down to about an inch and a half below the crest of the ilium, then turns and passes up upon the kidney nearly to the spleen, at which point it is firmly united to the omental tissue; turning again it passes obliquely to the lumbar vertebræ, descending in front of them and the sacrum to the anus. In the whole of its course it is closely attached. The ileum two inches from the valve is united by a firm band to the psoas muscle.

Liver.—Weight 4½ lbs.; closely adherent to the dia-

The gal-vanner

A cancerous girdle surrounds the middle of the organ, and the fundus is also affected.

Nothing abnormal in the *heart* and *lungs*.

Kidneys.—Two small cancerous nodules the size of peas in the cortex of the left organ, and two others somewhat smaller in the right.

Spleen, small, and looks healthy.

Pancreas.—The tail is firmly united to the tissue in the hilus of the spleen, forming a firm, hard mass, about the size of a walnut, which on examination is found to be cancerous.

Stomach.—About 20 small, punched-out ulcers, with hæmorrhagic bases are seen on the mucous membrane of the fundus.

The *intestines* are dark in colour, the veins full, and the coats sodden.

The abdominal *lymphatic glands* are not enlarged.

The *left external femoral artery* contains a firm thrombus.

The general character of the growth and the absence of any considerable mass of cancer elsewhere render it more than probable that the disease in the liver was primary. The presence of one large tumour, around which numerous smaller nodules are aggregated, is almost characteristic of primary cancer, the situation of which, however, is more commonly towards the under surface of the organ, and not, as in this case, just to the right of the longitudinal ligament. Though the weight of the organ was increased, its volume was decidedly diminished, an unusual circumstance in cancer, and one apt to lead, as I believe it did in the present case, to some confusion with cirrhosis.

Secondary Cancer.—Of three cases one followed cancer of the tongue, another cancer of the vertebræ and ribs, and in the third the primary lesion was in the gall bladder. The latter, a very remarkable case, is given in

detail by Dr. Bell, in *Canada Med. & Surg. Journal* for April, 1877. The pathological condition was as follows:

CASE LXXXIV.—*Cancer of neck of the gall-bladder and lymphatic glands in the portal fissure. Compression of the hepatic ducts. Secondary masses in liver. Enormous distension of gall-bladder and hæmorrhage into it.—Gall stones.*

Body that of a well-made, but spare woman. Skin intensely jaundiced; conjunctivæ yellow. Rigor mortis absent.

Abdomen.—On opening this cavity a few ounces of slightly turbid and sanguineous fluid were removed. The liver is seen to be somewhat enlarged, and extends fully 3½ inches below the margin of the ribs. Projecting from the under surface of the right lobe is an enormously distended gall-bladder, which reaches within two inches of the pubis. The upper surface is free, but to the left side it is attached by loose and somewhat fresh adhesions to the pushed up omentum and stomach. The apex, which is rounded, presents an irregular surface as if it had been attached, and on the side of the broad ligament, at a point a little to the right of the uterus, is a round space, covered on the surface with decolorized fibrin, hæmorrhagic below, which looks as if the gall-bladder had here been adherent. Behind it is firmly attached to the transverse colon. Traces of peritonitis in the form of thin flakes of lymph exist over the coils of intestines. An extravasation of blood has taken place into the tissues about, or rather upon, the peritoneum in the pelvic cavity, especially between the uterus and rectum. The corpuscles have subsided, leaving a pale yellow, fibrinous layer above, which is firm, and quite adherent to the surrounding parts.

Liver looks a little larger than normal, and is of a dark-greenish colour. Scattered over the surface are a dozen or more cancerous masses, white in colour, ranging in size

from a cherry to a walnut, the larger of them with depressed centres. The anterior portion of the right lobe is separated from the rest of the organ by a shallow groove, the position of which on the body was just below the costal border. The left lobe is flattened, and its anterior margin notched. On section the liver substance is deeply bile-stained; the lobules are not very distinct. There are but few cancerous nodules in the interior. On opening the distended gall-bladder it is found occupied by a large coagulum, the upper part of which, owing to the sinking of the blood corpuscles, is decolorized. Hardly any serum is present except that contained in the meshes of the clot. Nine or ten gall stones, about the size of marbles, and with numerous facets are found. At the neck a small irregular mass of cancer projects into the cavity, and completely blocks up the cystic duct. The walls of the bladder are thin, not cancerous, and at the posterior part, just where the transverse colon is attached, there is a portion infiltrated with blood. On close inspection it is seen that ulceration and destruction of the wall has here taken place There can be no doubt that by this process a vessel has been opened, and the hæmorrhage caused. The glands in the hilus of the liver are enlarged and cancerous, and compress the hepatic ducts. The portal vein does not appear to be interfered with.

Heart and Lungs, quite healthy; a few ounces of fluid in left pleura. Slight atheroma in aorta and aortic segment of mitral.

Spleen not enlarged, and of a deep brownish-red colour.

CASE LXXXVIII.—*Extensive abscesses in the mesentery, following typhoid fever. Suppuration of the portal vein and its branches in the Liver. Empyema. Perforation of the appendix vermiformis; Peritonitis: Miliary Tubercles in lungs. Amyloid degeneration of spleen, liver, and mucous membrane of small intestines.*

[illegible] typhoid fever [illegible] [illegible] [illegible]

section of the membrane, pus is found to spread uniformly between the folds, and, after thoroughly washing with water, it appears as if riddled by communicating cavities. In some spots the pus is limited within the capsules of lymphatic glands. On tracing the mesenteric veins from the intestinal border many are found to lead directly into these suppurating areas, others are shut off by thrombi. At the distal border, where the mesentery is cut away, close to the superior mesenteric artery, there is an irregular opening, from which pus flows, while a probe in it passes in several directions. Whether or not this represents the superior mesenteric vein it is difficult to say; the situation corresponds with it.

Liver, enlarged, firm to the touch, but at the same time yielding and elastic. On section the substance cuts with resistance, looks glistening, and on the application of iodine the intermediate zone of each lobule becomes a mahogany-brown colour, the central and interlobular areas remaining unaffected. On the surface of the organ, especially on the posterior and right borders are several small, irregular swellings, which on section are found to contain pus. The abscesses are tolerably numerous in these regions, and range in size from a pin's head to marbles. Many are in communication with each other, or are separated by narrow portions of liver substance. On closer dissection it is found that these abscesses stand in direct connection with, and indeed, are only suppurating portal veins. This having been ascertained, a thorough inspection of this vessel was undertaken. Outside the liver the vein is represented by an elongated abscess with thick, irregular walls, made up anteriorly of condensed connective tissue, posteriorly to a large extent by the head of the pancreas, the lobules of which have been laid bare in the suppuration. Immediately where the vessels enter the liver its calibre is relatively diminished. The *splenic* vein ends abruptly on the wall of the suppurating vessel, being

ed by one or two necrotic liver lobules of a glistening, opaque-white colour.

The first and second division of the vein passing to the hinder and right borders are considerably dilated, and on the lower wall the branches of the artery and duct are seen as elevated cords. The former at its commencement appears nearly double the usual size, and on the walls of all the larger suppurating veins its branches could be seen. The *common bile duct* is pervious and a probe can readily be passed into the hepatic ducts, which appear quite free from disease and contain bile. The cystic duct is also patent. At the junction of the cystic and hepatic ducts the sub-mucous tissue is greyish-white in colour, and the same condition extends along the former to the *gall-bladder*. This organ is large, somewhat distended, and contains about 3 oz. of laudable pus, not tinged with bile. The mucous membrane is transformed into a thick greyish-white structure, which is here and there congested. At the upper and back part of the opening of the cystic duct there is an irregular wide sinus leading towards the portal fissure, and along it a probe can be passed for 1½", terminating close to the dilated and suppurating branches of the vein. A direct communication with the latter could not be made out, but water poured into the sinus oozed out in the vein.

All the parts about the head of the pancreas are closely adherent together, and there are several separate lymphatic glands in a condition of suppuration.

Lying along the left side of the lower 2" of the abdominal aorta, and extending another 2½" at the left of the left internal iliac and ending on the wall of the rectum, is a narrow shut sac, full of pus, the walls thick, dark in colour, and lined by a definite pyogenic membrane. There is no communication with the rectum, the walls of which at the point of attachment appear healthy, nor is there any opening at the upper end.

The right renal vein is remarkably large and distended with blood, almost equalling in size the left renal vein. The left is also large.

Suppuration of the portal vein—pylephlebitis—is among the rare affections of the liver. Frerichs, collected twenty-six cases of which he has himself followed, as in this instance, suppuration of the mesentery, the others resulted from injury to the portal vessels in intestine and stomach, abscess of liver, &c. In the Pathological Society of London (Vol. xv.) three cases have been presented up to the present time.

The remarkable condition of vessels met with in this case and the absence of a proper clinical history render it somewhat difficult to decide upon the starting point of the process—the first link in the series. The typhoid fever may be regarded as the primary affection in which the suppuration in the mesentery and chain of retro-peritoneal glands was secondary; the pylephlebitis resulting probably from an extension of the inflammation in the mesenteric veins to the vena portæ and its branches. Another source of infection however was present, viz. the inflammation in the appendix vermiformis, which formed the starting-point of the disease in three or four of the recorded cases: but I see no reason in this instance to regard the ulceration and perforation of the appendix as anything more than an accidental occurrence, arising from obliteration of the orifice—probably the result of a typhoid ulcer—and retention of secretion. The fatal issue was due to the extension of the inflammation in the neighbourhood of the appendix to the general peritoneum. It is impossible to say, not having a clinical record, whether the empyema was a sequela of the typhoid fever, or of pyæmic origin resulting from the pylephlebitis, though it is remarkable to find how rarely pyæmic abscesses occur in this disease, being noted in only 5 out of the 25 cases collected by Frerichs. The

tuberculosis of the lungs was probably secondary to the empyema. A point of interest is the way in which the collateral circulation was established, though, unfortunately, owing to the length of time spent over the other conditions, no careful dissection could be made. The right vena azygos was greatly distended, and the left was also much larger than normal. The only distended veins observed in the abdomen were those about the hilus of the spleen, and the vasa brevia of the stomach.

SPLEEN.

Size.—The extremes occurred in a case of cirrhosis, in which the organ weighed 31½ oz., and in a case of cancer of the tongue in an old woman, greatly emaciated, in which it weighed only 2¼ oz.

In seven fatal cases of *Typhoid fever* the extremes were 7 oz. and 19 oz.; both in cases of perforation, the former at the end of the 2nd week, the latter after nearly two weeks convalescence.

Albuminoid degeneration occurred under the following conditions:—cancer of vertebræ; syphilitic ulceration of frontal bone, with gummata in liver; tubercular nephritis; pylephlebitis. In none was the enlargement very great.

Miliary tubercles were met with in three instances, one a case of general tuberculosis, the others chronic phthisis.

Fresh *infarctions* were found in a case of aortic valve disease, and in a case of Bright's disease during pregnancy. In the latter no affection of the heart could be determined.

The *capsule* in nine cases was thickened and fibroid, either in localized spots or over the whole surface. In one instance it was of almost cartilaginous character, and in another the localized thickenings were calcareous.

Small *supernumerary* spleens were met with in three cases.

Genito-Urinary System.

Kidneys.

Inflammation.—In two cases of death after lithotomy in old men these organs were extensively inflamed, though not in a condition of suppurative nephritis; one of them, case xciv (see below, under Bladder), the affection was limited to the apices of the pyramids, which were much involved and covered with a grey, diphtheritic-looking membrane.

Morbus Brightii. Of five cases two (xxix and xlvii), occurred in connection with pregnancy, death having taken place in the latter three weeks after delivery, in the former at the seventh month. They presented well-marked examples of the large mottled kidney, the organs weighing in both 10 and 11 oz. each.

Case lx was of special interest, but, unfortunately, the notes got mislaid and were not entered in the post-mortem book. It was an instance of chronic Bright's disease, with small contracted kidney, occurring in a girl aged 20, who had a well-ascertained history of an attack of scarlatina six or seven years before. The kidneys were reduced to about one-half the normal size, capsules firmly adherent, surfaces granular, substance very firm, cortices much diminished and the arteries very prominent. The heart was considerably hypertrophied, the left ventricle particularly so; no valve disease.

Tuberculous disease.—Miliary tubercles were met with in three cases of chronic phthisis, in three of general tuberculosis, and also accompanying the three following cases of chronic tuberculous nephritis.

Case xxi.—*Tuberculous disease of right kidney, pelvis, ureter and bladder. Tubercles in left kidney and lungs. Perforation of tuberculous ulcer in bladder. Peritonitis.*

John M., æt. 41.

Right kidney weighs 13 oz. On section a large caseous mass occupies the situation of the infundibula and pyramids, while the cortical portion is riddled with softening tubercles, hardly a trace of healthy-looking tissue remaining. The pelvis is somewhat dilated, and contains a few drachms of pus; the walls are thickened and caseous. *Ureter* as thick as the ring-finger, the mucous membrane swollen, and infiltrated with tuberculous matter, which is here and there softening.

Left kidney weighs 6 oz. About a dozen tubercles, the size of peas, occur in substance of the organ. Pelvis and ureter healthy.

Bladder united to the rectum by recent lymph. On opening it the mucous surface is rough, irregular, and contains numerous caseous masses, many of which have ulcerated. At the posterior wall is a large dark ulcer, in the centre of which are two small oval perforations. The outer surface of the organ is covered with fine miliary granulations.

The *prostate* is occupied by two large tuberculous cavities.

The lungs contain small cavities and caseous masses at the apices, and numerous miliary tubercles throughout the lobes.

CASE LIV.—*Old scrofulous disease of right kidney, which is converted into cysts. Recent affection of the left.*

J. T., æt. 32. For clinical report by Dr. Ross, see *Can. Med. & Surg. Journal*, Aug. 1877.

Right kidney, small, presents a lobulated appearance, and to the touch is semi-fluctuating. On section the whole organ is seen to be converted into a number of cysts containing a serous fluid in which white flocculi float. There are about a dozen of them, averaging the size of a walnut, and communicating together. The lining membrane of some of them is smooth, of others rough from the presence

enlarged. On section the lower third of the organ is occupied by four large cysts containing caseous matter, which lie more in the pyramidal portion, separated from the capsule by a layer of cortex $\frac{1}{3}$ of an inch in thickness.

The remainder of the organ is comparatively healthy, though scattered through it are numerous tubercles, ranging in size from miliary granulations to peas. The vessels are full, especially in the pyramids. The pelvis and calyces are slightly dilated, but not thickened, and only a few tubercles exist on the mucous membrane. The ureter is of full size, and the inner coat presents here and there a caseous patch.

Bladder small and contracted; mucosa rough and extensively ulcerated, the muscular coat being bare over the greater portion of the surface.

Lungs crepitant throughout. A tiny cavity, the size of a pea, in the right apex. A few miliary granulations in both.

Spleen; Malpighian corpuscles enlarged and translucent, reacting with Iodine.

Peri-nephritic Abscess.

CASE XXV.—*Suppuration about right kidney. Pyæmic abscesses in elbows, ankles, and anterior mediastinum. Peritonitis. Pleurisy.*

S. L., æt 11, sent to hospital supposed to be suffering from rheumatism, but the joint affections proved to be pyæmic in character.

On removing the intestines a large, fluctuating swelling is observed in the region of the right kidney, behind the peritoneum, and extending downwards in the direction of the psoas muscle. On cutting into it a pint of laudable pus escaped. The abscess is situated behind and below the kidney, the lower end of which is directly bathed by the pus. The Psoas muscle is infiltrated, and its fibres shreddy and degenerated. The pus has burrowed beneath

here and there eroded but not deeply. The muscular walls are hypertrophied, and strong bands cross each other on the inner surface. Around the urethral orifice are several outgrowths from the prostate; the largest is behind, springing from the base of the gland, and projecting like an enlarged middle lobe. The anterior one is irregular, not so prominent and is divided by small fissures. On the right between these two portions is a pedunculated tumour, a little larger than a pea, freely movable, and which fits directly over the orifice of the urethra, being displaced by the passage of the catheter.

The *prostate* itself is not much enlarged; the ducts are dilated and contain numerous reddish-brown calculi, the largest about the size of a buck-shot.

The *ureters* are moderately dilated, the right more than the left, the mucous membrane is swollen and inflamed.

The *pelvis* of the right *kidney* is dilated, and the lining membrane covered with a dirty greyish exudation. The same condition extends into the calyces and the apices of many of the pyramids are eroded. The same thing, though in a less degree, exists in the other organ.

UTERUS.—*Cancer.*

CASE XLI.—*Epithelioma of cervix; obstruction of the canal; dilatation of the uterine cavity. Pyrometra.*

A. J., æt. 80.

Uterus.—On removal of the abdominal viscera, an oval tumour is seen to occupy the pelvic cavity, extending to the brim, and situated in the position of the uterus, between the bladder and rectum. It is soft, fluctuating, and on examination proved to be the greatly distended body of the uterus. On attempting to make out its exact position, the finger was accidentally thrust into the lower part of the tumour, (the walls in this situation being very thin) and a large quantity of pus escaped. On removal of the pelvic viscera it is found that a cancerous mass involves the

cervix uteri, and upper part of the vagina, occupying the whole circumference of the former and the upper third of the latter, not extending to either rectum or bladder. No trace of the canal of the cervix remains, an irregular portion, somewhat pedunculated, corresponds to the position of the os externum. The disease is confined almost entirely to the cervix, extending only to a slight extent around the lower zone of the body, causing a thickening of the wall in this situation. The cavity of the organ is dilated into a sac, the size of a cocoa-nut, which contains nearly a pint of pus. The walls are thin, scarcely 3″ in diameter; the inner surface smooth and of a dark-grey colour. The round ligaments and Fallopian tubes are inserted at the junction of the lower and middle thirds of the dilated body. The latter are not enlarged; one could be traced and opened as far as the wall of the uterus, where it was lost. There is no dilatation of the internal orifices.

The cancer is soft and white in colour in the vagina and lower part of cervix, firmer above where it gradually merges with the uterine wall. In histological characters it corresponds with the so-called epithelioma of this region.

No secondary masses of cancer.

OVARY.

CASE LXXXI.—*Dermoid or Piliferous cyst of right ovary. Chronic Phthisis. Pneumo-thorax.*

J. C., æt. 21.

Right ovary is occupied by a mass the size of an orange, which to the touch is yielding, as if filled with putty-like material. On incising it the capsule is found to be thin and membranous, easily peeled off, exposing a fatty-looking mass, around which are numerous brown and black hairs. At one point a dense whisk passes round the entire circumference of the tumour. The hairs are readily

detached and average eight or ten inches in length, being pointed at both ends. They are nearly all superficial, forming a thin layer, immediately within the capsule, and on top of the fatty sebaceous matter, which constitutes a layer ½" in thickness, white in colour, and containing a few hairs. This rests upon the central body of the tumour, which forms a firm mass, about the size of a walnut, closely attached to the broad ligament, at the usual site of the ovary. The surface is rough, irregular and pitted, and from it numerous hairs arise and pass out through the sebaceous matter. The layer has the structure of skin, and contains numerous hair follicles and sebaceous glands. On section of the central mass a small cavity, the size of a marble, is found, full of clear, viscid fluid. Beneath this, corresponding to the attached border of the tumour, the parts are very dense and hard, and on careful dissection an irregular piece of bone was found, shaped somewhat like the flange of a screw, having a handle-like process, and an expanded, concave body, which is beset on both surfaces with sharp dentate projections. In colour and hardness it resembles enamel.

Cerebro-spinal System.

Tuberculosis.

Case xviii.—*Small cavity and caseous masses in lung. General tuberculosis. Meninges of brain unaffected; central softening. Spinal meninges extensively involved.*

O. B., æt. 20, sailor. Symptoms chiefly spinal, and attributed to a fall which he had sustained three weeks before his death.

Autopsy 36 hours after death.

Brain, extremely soft, and with difficulty removed. Subarachnoid fluid in excess. Large veins of pia mater moderately full. Convolutions pale and flattened. Arach-

[illegible] both at
[illegible] from the
[illegible] lymph or
[illegible] and pia
[illegible] tubercles
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[illegible] extend
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of the lumbar enlargement being much distended. On exposing the pia mater a thin layer of yellowish-white lymph covers it in the dorsal and lumbar regions, becoming more abundant at the cauda equina, the filaments of which are surrounded by thick lymph as far as the termination of the sacral canal. On the lumbar enlargement is an isolated white mass, looking like an enlarged tubercle, attached to the pia mater, but on section the contents are soft, and like the lymph over the general surface. The vessels of the pia mater on the posterior part of the cord are full, on the anterior empty. Scattered over the membrane, chiefly along the course of, and about the vessels, are numerous miliary granulations, most abundant below the cervical enlargement, only a few being noticed above this point. The cord appears very tightly embraced by the pia mater, so much so that the surface looks wrinkled, and on puncturing it at the cervical enlargement, the white substance bulges out as a soft rounded mass.

Section of the cord shows it to be very soft, but not otherwise altered.

Lungs.—Small caseous masses in both apices, and in the left an old cavity, the size of a walnut, with firm dark walls. Rest of organs crepitant, but stuffed with small miliary tubercles, isolated, angular, and translucent.

Spleen.—Innumerable firm miliary granulations throughout the tissue.

Kidneys.—A few tubercles in the cortex of the right organ.

Liver contains scattered tubercles.

CASE XLIII.—*Meningeal affection slight. Ventricles distended, walls soft. Very few miliary tubercles in the organs.*

E. H., a delicately built girl, æt. 19; symptoms chiefly cerebral.

Brain. Parts about the optic nerves matted together,

and the arachnoid opaque. No lymph at the base or in the Sylvian fissures. Careful inspection fails to discover any tubercles on the pia mater; but on stripping off the membrane on the Sylvian fissures, and washing it in water, numerous miliary granulations can be seen, chiefly as fusiform thickenings of the small arterioles passing into the convolutions. Veins on the cortex moderately full, convolutions a little flattened. On section of the hemisphere, the white substance is of average consistence, but moist. The lateral ventricles are large, and contain a slightly turbid fluid. The ependyma is granular; over the ganglia, soft. Fornix and septum very soft, and could not be lifted up.

Spinal cord. Veins full. Arachnoid in cervical portion opaque. On the visceral layer of arachnoid in the lower three-fourths of the cord there are numerous small cartilaginous plates, thin, flexible, irregular in outline, and presenting the usual glistening appearance of these bodies. No tubercles on pia mater.

Lungs. Lower lobe of right, heavy, airless, and contains much blood and serum. A few tubercles through the substance of both organs. Bronchial glands enlarged; one presents several caseous masses, the others, small, firm miliary granulations. No tubercles in the other organs.

CASE LXXV.—*Meningeal affection very extensive on the cortex, slight at the base. Ventricles large, walls not soft. Large caseous mass in left lung. Miliary tubercles in lungs and on peritonæum.*

J. S., æt. 2½, male child, much emaciated. Cervical glands much enlarged; one over ramus of right jaw fluctuates.

Brain. On surface the veins of pia mater look full, and there is a good deal of fluid beneath the arachnoid. A thick layer of yellowish-white lymph exists along the longitudinal fissure, especially on the right side, and on

separating the hemispheres the same is seen in the region of the occipito-parietal fissures. On the inner surface of the left hemisphere, near the fissure of Rolando, is a thick, tuberculous patch, which extends into the brain substance for a quarter of an inch, and the pia mater about it is studded with small tubercles. Over the left frontal convolutions above there are eight or ten tubercles, the size of No. 8 shot. On the right parietal lobe, just above the Sylvian fissure, there is a thick layer of lymph. The base is comparatively free, the arachnoid clear, and no lymph is seen. In the right Sylvian fissure the parts are matted together, and tubercles may be seen about the smaller arteries. On section of the hemispheres, the brain substance is found to be glistening and moist, not hyperæmic. The ventricles are moderately enlarged, and contain a clear serum; ependyma clear; walls not softened, and the fornix and septum are tolerably consistent, being lifted without tearing.

Lungs. The left has a peculiar soft puffy feel. At the lower part of the upper lobe is an oval caseous mass, the size of a large cherry, firmly encapsuled and dry. The rest of this organ and the right lung are stuffed with miliary tubercles, all of which are small, isolated, and translucent; no cheesy masses in the latter. Bronchial glands enlarged; two caseous. A few tubercles on both layers of the pleura.

Peritonæum. On the visceral layer, especially over the shrunken small intestines, are numerous small dark tubercles, from size of No. 8 shot to peas. On the parietal layer they also abound, and on the left side form a flattened irregular mass, with very dark edges. The glands at the root of the mesentery are enormously enlarged and caseous, forming a bunch as large as the closed fist of the child.

No tubercles in the other organs.

CASE LXXVI. — *Slight meningeal inflammation. One caseous mass and a few tubercles in Lungs. Old morbus coxæ.*

A. B., æt. 5½, an ill-nourished, emaciated child.

Brain. Pia mater injected, and of a deeper red colour than usual. No tubercles or lymph about cortex or sides, but the arachnoid over the sulci is cloudy and granular. At the base the arachnoid is quite clear, but the pia mater is somewhat more adherent than usual and matted about the chiasma. No lymph. On the Sylvian fissures small tubercles occur on the arterioles, and in the right there are a few flakes of lymph. On the small arteries over the pons and medulla are numerous translucent granulations. At the upper border of the cerebellum, near its attachment to the cerebrum, there is a layer of thick lymph. On section of the hemispheres the brain substance is moist; puncta vasculosa distinct. The ventricles are slightly dilated, and contain a clear fluid. Walls not so firm as natural. Fornix and septum tear easily. Velum interpositum and choroid plexuses cloudy, and a few tubercles are seen about the arteries.

Lungs. At extreme apex of right is a small caseous spot, the size of a pea, and in the tissue for an inch about it are two or three dozen miliary tubercles. In the left lung, which is crepitant throughout, there are also a few miliary granulations at the apex. *Bronchial* glands are large, one or two of them caseous.

Head of *right femur* is rough and ulcerated, no cartilage remaining.

GENERAL DISEASES.

Pernicious Anæmia.

CASE LXI.—*Profound Anæmia without discoverable lesion. Fatty degeneration of organs. Hyperplasia of bone-marrow.*

G. A., æt. 52, an Englishman.—For clinical report by

Dr. Gardner, see *C. M. & S. Journal*, March, 1877. A description of the blood and bone-marrow, by Dr. Gardner and myself, occurs in the *Centralblatt f. die medicinischen Wissenschaften*, No. 15, 1877: Berlin.

Autopsy,—Thirty-two hours after death.

Body that of a well-built man of fair muscular development. Hair grey. No emaciation; panniculus adiposus well developed, especially over abdomen. Skin of extraordinary pallor, with slight lemon tint, the shoulders marked with patches of deeper yellow hue. A few old psoriasis spots seen in the region of the elbows and knees. No petechiæ. Lineæ albicantiæ in the skin of groins, and upper and outer aspect of thighs, and on the outer edge of anterior folds of axillæ. Fingers slightly clubbed, and the nails of both hands markedly incurvated. Rigor mortis moderately well marked. Post mortem stains scarcely perceptible, No enlargement of the superficial lymphatic glands. No cadaveric odour.

Brain.—Not examined.

On making the preliminary incision a layer of deep yellow fat, fully an inch in thickness, is cut through over the abdomen. Muscles of the thorax of a remarkably healthy red colour. In the abdominal cavity the position of the viscera normal. Omentum moderately fatty. In the thorax a considerable amount of fat over the pericardium. The left pleural sac contains twelve ounces of bloody, yellowish-tinged, serum. A few strong adhesions posteriorly. In the right pleural sac ten to twelve ounces of fluid of the same character. Adhesions more numerous at apex and sides.

Pericardium.—Contains six drachms of a yellowish, bloody serum. No ecchymoses on either leaf.

Heart.—Large, excessively flabby. Sub-pericardial fat abundant about the base and in the anterior ventricular groove. Patch of attrition over upper part of right ventricle in front, and another behind, near the inferior vena cava. On opening the heart in situ an ounce of

blood, with one small coagulum, in the cavities of the right side, and ten drachms in those of the left. Organ flaccid, and walls collapsed when on the table. Right auricle normal. Right ventricle somewhat dilated, the endocardium stained by imbibition. Tricuspid valves a little thickened and gelatinous at the edges; orifice of normal size. Pulmonary semi-lunar valves healthy, one segment fenestrated. Cavity of left ventricle large, walls of normal thickness. Mitral valves quite healthy, a little stained, orifice of proper size. Aortic semi-lunar valves a little opaque; slight atheroma at their base, and on the aorta opposite their free borders. Sinuses of Valsalva very distinct. Nothing abnormal in the left auricle. Muscle substance of the organ exceedingly pale, having a yellowish, faded-leaf appearance, especially marked in the walls of the left ventricle.

Aorta.—Both arch and trunk of full size. Beyond the left sub-clavian there is a flattened patch of atheroma, about the size of a half-penny.

Lungs.—Deeply pigmented; crepitant throughout; lower lobes œdematous and dark in colour posteriorly, The mucous membrane of the *Trachea* at the bifurcation, and extending irregularly nearly to the larynx, is represented by a number of bony plates, lying immediately upon the cartilages, which are themselves very dense and partially ossified.

Spleen.—Weight, six ounces; soft and flabby, Capsule a little opapue. On section, pulp soft, of a light brownish-red colour. Trabeculæ distinct. Malpighian corpuscles not evident. Very little blood in the organ; none could be obtained from the splenic vein.

Left Kidney.—Length, 5″. Unusual amount of superficial fat. Capsule loosely attached and on removal leaves a very anæmic-looking organ. No atrophy of the cortex, which is pale and bloodless. Pyramids, except at the bases, also pale. *Right Kidney*, 4¼″ long, dark red in colour, uniformly congested, forming a striking contrast

to the other. Capsule easily detached; stellate veins prominent. On section, both cortex and medulla contain much blood.

Supra-Renal Capsules.—The right is soft in centre, and somewhat larger than the left, but nothing unusual about either.

Bladder.—Distended with pale urine. Mucous membrane healthy looking. Prostate gland of full size.

Tonsils and glands at root of tongue not enlarged. Several ecchymoses beneath the mucous membrane of the anterior wall of the pharynx.

Œsophagus presents nothing unusual; a few small extravasations are noticed near the cardia.

Mucous membrane of *stomach* pale, and at the cardiac end thin; at the pylorus it is thicker.

Duodenum healthy; common bile duct is pervious.

Jejunum contains a quantity of dirty yellow mucus. Mucous membrane is pale. In the *ileum*, Peyer's patches are scarcely perceptible; the solitary glands towards the ileo-cæcal valve are alone distinct. In the *large bowel* the mucous membrane is anæmic. No ulceration. Scybalæ in transverse and descending colon.

Liver.—Rather small, of a light yellow colour, especially in the left lobe. Capsule smooth. On section a small quantity of liquid blood is seen in some of the hepatic veins. In places there is a very slight injection of the intra-lobular veins, which relieves the otherwise uniformly pale surface.

Gall-bladder.—Full of dark tarry bile.

Pancreas.—Looks healthy.

Abdominal blood-vessels almost empty. No blood in inferior vena cava or aorta. Intima of both healthy-looking. *Thoracic Duct* pervious throughout. Mesenteric and retro-peritoneal *lymphatic glands* small, the former unusually so, requiring considerable searching to obtain any. The amount of blood in the body appeared remark-

ably diminished, and it was only by pressing along the limbs that sufficient could be obtained to fill a small homœopathic phial.

Piece of the sternum, the upper half of right fibula, the inner third of left clavicle, half a rib, and one of the last dorsal vertebræ were removed for the examination of the marrow. Blood was collected from the heart, and junction of the left jugular vein with the sub-clavian.

A striking feature in the autopsy is the extreme anæmia of the organs, their almost entire bloodlessness and consequent pallor, the right kidney excepted.

HISTOLOGICAL EXAMINATION.

The blood examined during life, and after death, presented the following appearances. (Hartnack, No. 9 im. and Oc. 3.)

About one-half of the red-blood corpuscles run together to form rouleaux. The majority of them appear of large size but do not present the characteristic round contours of these bodies; many are ovoid, others lozenge-shaped, or of various forms, with irregular projections and processes. Isolated corpuscles look of the natural pale yellow colour, but the alternating light and dark centre with the change of focus is not so distinct as usual. On touching the top cover and causing them to roll over, many do not present the bi-concave appearance, but look thin and flattened out. A limited number are crenated. In each field certain small round red corpuscles are seen, sometimes as many as six or eight. They are spheres, not biconcave, of a pale yellow colour, occasionally crenated or irregular in form.

The measurements of some of the coloured elements are given below (Hartnack No. 16 im.), from which an accurate idea is obtained of the remarkable discrepancies in size. About forty measurements were made of corpus-

cles taken at random in two or three specimens obtained a few days before death. Of these one was 1-1833″ by 1-2619″, being somewhat elongated. Five ranged from 1-2750″ to 1-2115″, these being the extremes. In twenty-two the range was from 1-3000″ to 1-4200″. In this group the ordinary-looking red disks occurred. In five the diameter varied from between 1-5000″ and 1-9000.″ In five the diameter was less than the 1-6000″, the lowest being 1-6874.″

Prolonged examination failed to discover a single nucleated red corpuscle.

The colourless corpuscles did not appear relatively increased. One or two were seen in each field of the No. 9 and 3. The measurements in five corpuscles ranged from 1-2500″ to 1-1800″. They were quite natural looking, and displayed a remarkable degree of vitality. In a slide mounted and surrounded with paraffine at 1 P.M., the amœboid movements were very active, the temperature of the room being about 60°.* At 7 P.M. the slide was carried in the hand a distance of a quarter of a mile to the house of a friend (temperature 14.2° F.), and the irregular changes in outline were still observed, and continued until 8:40, when the observation was discontinued. There was an entire absence of Schultze's granular masses.

Prolonged examination of different specimens after death, made for this special object, resulted in the detection of two nucleated red blood corpuscles.

Heart.—The fibres are in a condition of extreme fatty degeneration, the striæ being obscured by the number of densely crowded droplets and fine molecular fat; only

* It may be here mentioned that the statement of Ranvier, Traite d'Histologie (p. 240), that the amœboid movements of white blood corpuscles do not go on at ordinary temperatures is incorrect. In University College Laboratory, London, I found on one occasion that the amœboid movement continued in the colourless corpuscles twenty-four hours after removal from the body. The blood was sealed in a capillary tube, and remained at the ordinary temperature in the month of June.

here and there a fibre occurs in which the striæ are faintly seen, In teased preparations numerous short bits occur, together with oil-drops and granules of fatty matter. In places there appears to be a good deal of interfibrillar connective tissue with fat cells.

Muscles of the Trunk.—The fibres of the thoracic muscles—which were observed to be of such a natural appearance—present no trace of fatty degeneration.

Spleen.—The ordinary corpuscles of the pulp, together with elongated, sometimes branched, cells of the retiform tissue are the chief elements seen in teased specimens. The red corpuscles have lost their colouring matter. A few cells containing red blood corpuscles are seen, but no nucleated red cells.

Kidney.—Teased preparations show the epithelium of the tubules, both in the cortex and pyramids, covered with fatty matter in the form of minute drops and fine granules; nowhere, not even in the large collecting tubes are the cells distinct. The Malpighian corpuscles also contain many granules and small oil-drops, and the same exist abundantly in the field.

Liver.—Cells are stuffed with oil-drops; none noticed without them, while in many the protoplasm and nucleus are entirely obscured. Free fat exists infiltrated between the cells, and in the field. In a few bile pigment is seen.

Mesenteric Glands.—Teased portions present a large number of perfectly normal-looking lymph corpuscles, among which the connective tissue elements occur in the usual proportion. Many of the small vessels and capillaries have their walls uniformly studded with fat grains, and may be traced as dark branching lines. In others, the deposition in not so extensive.

Nothing abnormal observed in the axilliary lymphatic glands.

Medulla of Bones.—The marrow of all the bones examined—sternum, ribs, clavicle, vertebra, fibula—is of

a dark violet-red colour, thick, about the consistence and colour of the spleen pulp in fever. In the clavicle it is more diffluent, of a lighter red colour, and to the naked eye looks a little fatty—an appearance not noticeable in the other bones, not even in the shaft of the fibula.

On microscopical examination, the following elements were found :—

(1) Colourless corpuscles—marrow cells—of various size, with granular protoplasm, and bold vesicular nuclei. The greater number of these are larger than white blood corpuscles, and have usually a single nucleus, sometimes two. Others are smaller, more approaching the blood corpuscles in form, while in all the specimens examined, small round cells, like ordinary lymph corpuscles, are also found. The above represent the common colourless elements found in marrow, and they form the majority of the corpuscles in the field. In eight of the larger cells the extremes of measurement were 1-1571″ by 1-1833″ and 1-2200″ by 1-2895″.

(2) Coloured blood corpuscles, of which two varieties are seen ; (*a*) ordinary biconcave disks, somewhat irregular in shape, and often, as noticed in the blood during life, provided with long processes. They are abundant, forming the large proportion of coloured elements. In the fibula, sternum, and ribs the colouring matter is retained, while in the vertebra and clavicle it has disappeared from most of the corpuscles, aad they are recognizable only as outlines. (*b*) Small round red corpuscles, non-nucleated, from one-quarter to one-half the size of ordinary corpuscles, and similar in appearance to the small forms seen in the blood. They occur most numerously in the marrow of the fibula, where they form fully one-fourth of the coloured corpuscles. In the sternum and ribs they are not so abundant, though occurring in each field. As described in the blood itself, they do not appear to be biconcave disks, but spheres. The colouration is quite

as intense as in form *a* and a few were observed to be crenated.

(3) Nucleated red corpuscles, the "transitional" forms of Neumann, which are numerous in the sternum and ribs, less so in the tibia, while in the clavicle and vertebræ they occur scantily, or, owing to the general decolorization of the red corpuscles in these bones, are seen with difficulty. As shown by the measurements given below they are as a rule larger than ordinary blood corpuscles, but present, like them, a perfectly homogeneous coloured stroma, in which a finely granular nucleus is imbedded. They are spheres, not biconcave, as a rule round, though frequently irregular in outline, or with one end pointed and prolonged. The intensity of the colouration in most equalled that of the ordinary red corpuscles, in some instances being deeper, in others not so marked. The nuclei are either round or elliptical, and occupy from one-quarter to one-half of the body of the cell (see measurements). They are solid, granular, and inside the corpuscles look coloured, though not so deeply as the surrounding substance. The presence of nucleolus could not be determined. The position in the cells is variable; in specimens examined within a short time after the post-mortem they appeared to be chiefly centric, but in preparations taken the next day very many of them had become quite peripheral, while others had protruded almost through the corpuscle, when it could be clearly seen that the nucleus was colourless. In several instances the nuclei are seen to be entirely outside the cells, though remaining attached to them. In this condition they look not unlike the small lymphoid marrow cells, and it is only the large size of the corpuscles to which they adhere, and the fact that in the same field others may be seen half-way out, that enables a correct opinion to be formed. In three or four instances dumb-bell-shaped nuclei were noticed. Cells with two nuclei were not uncommon,

and instances with three and four were observed. As remarked above, the nucleated red forms are numerous in the sternum and ribs, six to eight being seen at once in the field of the No. 9 im. and 3, while in the fibula not more than three or four were noticed in any single field. In fifteen measurements of these forms, eleven were above the 1-2000″; five being 1-1428″. The following measurements are of three corpuscles with their contained nuclei :— (1) 1-1774″ by 1-2200″; nucleus 1-2619″ by 1-2896″. (2) 1-2200″ by 1-2391″; nucleus 1-5500″ by 1-5000″. (3) 1-2037″ by 1-1964″; nucleus 1-3666″ by 1-3235. A good idea of the irregularity in outline of these corpuscles and the slightly elliptical character of the nuclei may be gathered from the above.

(4) Cells containing red blood corpuscles. These are very abundant in the marrow of the vertebra, three or four occurring in the field at once, and containing from five to six red corpuscles, the colour and outlines of which in most cases are preserved. In the sternum and ribs they are not nearly so numerous; in the fibula and clavicle they were not observed.

(5) Myeloplaques, of which one or two only were met with in the marrow of the sternum and rib. Neither in the shaft nor epiphysis of the fibula could these forms be determined.

(6) Fat cells, which are present in marrow of the clavicle in small numbers, absent in the sternum, vertebra, and rib. In marrow from the fibula an oil drop is occasionally met with in the field, but here also they are almost entirely absent.

(7) The octahedra crystals, first described by Charcot, and which always occur in the marrow from twelve to thirty-six hours after death.

CASE XCVII.—*Profound anæmia, without discoverable lesion. Fatty degeneration of organs. Hyperplasia of bone-marrow.*

J. B., æt. 47, an Englishman. For clinical report, by Dr. Bell, see "Transactions of Canada Medical Association," vol. 1, 1877. A description of the blood and bone-marrow in this case also occurs in the *Centralblatt f. d. med. Wissenschaften*, No. 25, 1877.

Body that of a spare man, 5 feet 5 inches in height; complexion fair, hair light, whiskers red. The skin presents a yellowish tinge over the whole body, most marked on the face, neck, and shoulders. Rigor mortis well developed. Slight œdema of lower extremities. Four or five smooth white cicatrices on the right side of the leg. Freckles abundant on forearms. Panniculus adiposus thin.

Brain.—Skull unusually thick; marrow of diploë red. About 2 oz. of serum escaped on removal of the dura mater. Vessels of the pia mater empty. Pacchionian granulations numerous. Brain substance pale, of good consistence. Nothing abnormal in the ventricles or ganglia at the base. The remarkable pallor of the tissues is the most noticeable feature. Weight, 3 lbs. 3 oz.

Thorax and Abdomen.—The voluntary muscles exposed in the preliminary incision are of rich dark-red colour. Intestines and omentum pale and bloodless; position of abdominal viscera normal. In the thorax the right pleura contains a pint of reddish serum, the left half a pint, in which a few flocculi of lymph are seen. There are pigmentary (?) deposits upon parietal layer over diaphragm and bodies of the vertebræ.

Pericardium is normal, a few ecchymoses on visceral layer over left ventricle.

Heart, very flaccid, walls of chambers collapsed. A good deal of sub-pericardial fat, especially over the right

cavities. Venæ cavæ nearly empty. Right auricle contains 3 iss. of blood, light claret-coloured, and one small coagulum, partly decolorized. Right ventricle contains a small amount of blood; walls thin; endocardium stained. Valves healthy. Musculi papillares pale yellow colour. Left auricle empty. Left ventricles contain very little blood; lining membrane stained. Walls of normal thickness, muscle soft, somewhat paler than normal. Valves healthy. Aorta of normal diameter.

Lungs; pigmentation moderate; slight congestion (post-mortem) in dependent parts, and also an excess of serosity. Structure healthy.

Spleen, slightly enlarged, weighs 3 x. Numerous adhesions, infiltrated with serum, bind it to the diaphragm, stomach, and colon. On section, pulp very soft, almost diffluent, dark red in colour.

Left kidney, 5½ inches long. Section shows a pale, coarse organ, somewhat softer than natural. *Left supra-renal capsule* pale, soft in the centre.

Right kidney, moderately congested in the cortical portion and at bases of pyramids. Cones very pale. *Right capsule* healthy. Bladder healthy. Vesiculæ seminales contain spermatozoa. *Stomach* distended with gas; contains about 4 oz. of a brownish viscid fluid. Numerous ecchymoses along the greater curvature, especially at the cardiac end. The veins contain blood. Mucous membrane looks normal.

Duodenum and *jejunum* healthy. Coats of the *ileum* very thin, translucent, and anæmic. The solitary glands are prominent in the upper part; only one patch of Peyer found in the lower portion. Large bowel normal.

Mesenteric glands appear even smaller than natural.

Pancreas healthy.

Liver, a few ecchymoses on capsule, a small cicatrix on upper surface of right lobe. Substance pale, in parts much softened. Weight 3 lbs. 8 oz. Gall bladder contains normal-looking bile.

HISTOLOGICAL EXAMINATION.

The *blood* examined during life was very thin, watery, and of pale claret colour. It presented the following characteristics:—Colourless corpuscles appear perfectly natural in structure and size, and are not numerically increased. No large granular ones, such as described by Litten* could be found. Two forms of coloured corpuscles: (*a*) ordinary forms, which are paler than natural, flattened out, less biconcave, and very irregular in outline, some ovoid, others with sinuous borders, others again with pointed processes. (*b*) Small red corpuscles—microcytes,—erroneously described by Eichorst as pathognomonic of this affection. They were numerous, 8 to 10 occurring in the field of No. 9 im. and oc. 3. The diameter ranged from 1-5000″ to 1-9000.″ They equalled, or even exceeded, in colouration the ordinary forms; some were crenated, and they frequently presented a pit or cup-like depression on one side. In the repeated examinations of the blood, extending over three months, these forms increased but little numerically.

Schultze's granular masses were not noticed. No appreciable difference could be detected in the histological appearance of the blood an hour after the transfusion.

The *heart* presented signs of moderately advanced fatty degeneration, the striæ in many fibres being obscured by molecular fat and droplets of oil.

Spleen.—The normal elements, cells of the spleen pulp, and spindle-shaped corpuscles of the trabecula, together with numerous blood corpuscles, were the only structures noticeable in teased preparations.

Kidneys.—In both cortical and pyramidal portions the cells of the tubules appear very granular, somewhat swollen, and a large number of oil droplets are seen in and about the tubules.

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* Berliner Klinische Wochenschrift, No. 19, 1878.

Liver.—Cells contain oil drops in excess, and in many the nuclei are obscured. There is also some fatty infiltration.

The *marrow* of all the bones examined, sternum, ribs, vertebræ, radius, fibula, was of a violet-red colour, of good consistence, and with the exception of that of the fibula, contained no fat. There were found the ordinary large, coarsely granular, marrow cells, numerous small lymphoid corpuscles of both sizes ; and, in addition, very many nucleated red blood corpuscles, corresponding with those described by various writers as occurring in the marrow in cases of leukæmia, and by Cohnheim* and myself† as constituents of this tissue in cerain cases of pernicious anæmia. There were not many in the marrow of the sternum, fewer still in that of the vertebræ. They were considerably larger than the ordinary red blood corpuscles and of about the same intensity of colouration. The majority had only one nucleus, but cells with two, three, and four were not uncommon. The position of the nucleus was usually eccentric, often, indeed, protruding half way from the corpuscle. The nuclei were colourless.

* Virchow Archiv., lxviii. 1876.

† Centralblatt f. d. Med. Wissen, No. 15, 1877.

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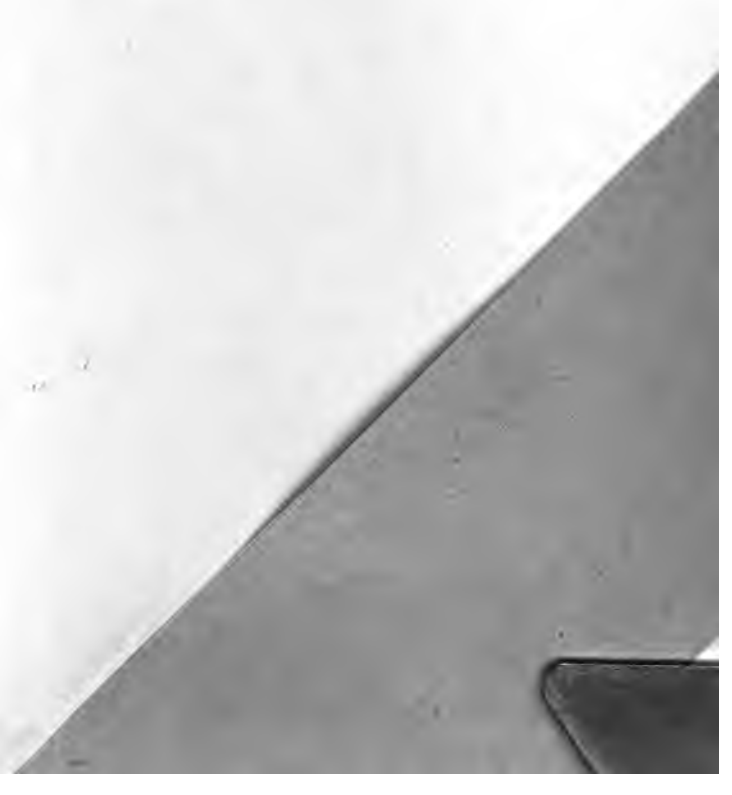
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